NARRARIVE LITERATURE REVIEW AND GAP ANALYSIS OF DIABETES SERVICES IN A COMMUNITY SETTING

by

Jennifer Shaw

BSCN, University of Victoria, 2004

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ABSTRACT

The goal of this project was to outline best practices regarding the organization of diabetes care and services in the community in relation to the local context of services in Squamish, BC, Canada to create a foundation for future quality improvement work. The theoretical framework of person-centered care is essential to chronic disease management and underpins this work. The methods include: 1) A narrative literature review consisting of a database search, and 2) A gap analysis consisting of local data and an environmental scan. The Chronic Care Model is an evidence-based integrated care framework used to organize the findings of the narrative literature review and the gap analysis and to frame the recommendations (Clement et al., 2018). Based on the findings, evidence-based recommendations were created specific to the context of diabetes care in Squamish, BC creating the opportunity for meaningful future quality improvement work.

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CHAPTER 1

Introduction

Diabetes is a one of greatest growing health challenges worldwide with the global prevalence growing from 4.7% in 1980 to an estimated 8.8% of the population in 2020 (International Diabetes Federation, 2019; World Health Organization, 2020). The World Health Organization (WHO) (2016a, 2002) advocates for a shift away from the current organization of health care systems where patients are passive recipients of care to an integrated person-centered approach. Current health care systems are not organized to support chronic disease management; systems are fragmented, disease-centric and oriented to acute problems (World Health Organization, 2016a, 2016b, 2002). In order to achieve high quality, effective and cost-efficient care, chronic disease management requires patients to become active collaborators in integrated systems (Goodwin et al., 2012). This person-centered approach is critical to improvements in diabetes management and therefore, is the key theoretical perspective framing this project (BC Ministry of Health, 2015c).

Type 2 diabetes is a largely preventable and treatable condition requiring multifaceted care occurring predominantly in primary and community care settings (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; International Diabetes Federation, 2019). There is significant research and literature supporting best practices in diabetes care; however, there is no standardized framework for the delivery of care in BC, Canada (Diabetes Canada, 2019). Furthermore, rural communities often lack services associated with improved outcomes for type 2 diabetes such as multidisciplinary team-based care and specialized diabetes care services (Ricci-Cabello et al., 2013). Competing priorities for resources have resulted in changes in how diabetes care is delivered in Squamish, BC – a rural community situated 64 km from Vancouver.

A potential gap in services for type 2 diabetes management prompted this inquiry into understanding: What evidence-based standards exist regarding the organization of diabetes care and services, what services are we currently providing in Squamish, BC, and finally, what recommendations can be made to enhance the quality of care?

This paper consists of a narrative literature review and gap analysis. The narrative literature review outlines current themes regarding how diabetes care is organized and delivered for optimal outcomes in a rural community setting. The review sets the foundation for a gap analysis between the current services offered in the community and the desired state of diabetes care in Squamish. The gap analysis includes local data and an environmental scan to provide context to the current state of diabetes care and to identify community resources beyond the services provided by the Home Health program in Squamish. The findings are organized under the six elements of the Chronic Care Model created by Wagner et al. (1999): self-management, delivery system design, decision support, clinical information systems, community resources and health system organization. This model is an evidence-based framework designed to support quality improvement efforts to optimize chronic disease management (Clement et al., 2018; Wagner et al., 2001). The Chronic Care Model is one of the most widely adopted integrated care models to improve outcomes for individuals with chronic disease (World Health Organization, 2016b). Optimization in each of the six elements of the model are associated with improved diabetes outcomes (Clement et al., 2018; Elissen et al., 2013b).

Recommendations were developed based on the results of the literature review and gap analysis and create the foundation for future quality improvement work. Part of the key recommendations include future work to integrate the perspectives of community members living with type 2 diabetes and key stakeholders. This is planned via a focus group session and a

key stakeholder meeting. This participatory planning allows community members and stakeholders to be collaborative partners in reorienting care to a person-centered integrated approach.

Positioning Self in the Context

Working as the clinical resource nurse (CRN) for the community home health team in Squamish, BC, I was placed in the unique position where I was aware of the potential gap in diabetes services for the community, yet I was not directly responsible for the care of clients with diabetes. This awareness led to a responsibility to support any required change to improve diabetes services. I was fortunate to be working alongside many of the key stakeholders responsible for diabetes care services such as the community dietician and the manager for the community Home Health program. This allowed for conversations regarding the current state of services and what they imagined as ideal. Since my area of practice was focused on supporting the role of the community health nurses who were not directly involved in diabetes management, I felt less attached to the results of the gap analysis and quality improvement ideas. I was able to maintain a curious attitude. Without a professional background in diabetes care, I had little experience from which to begin the project, but this also provided less bias. Therefore, the literature review began as a broad discovery of the guidelines, concepts and themes that govern and influence diabetes care around the globe, and then focused on utilizing the Chronic Care Model as a framework to further refine the search. Reflexivity still remained key as ideas and conversations evolved. Referral rates for diabetes services were requested from the program manager and dietician to provide context and scope to the problem. As part of the role of CRN, I had access to the electronic medical record (EMR) and the DASH: Decision Analytics Solutions for Health website from Vancouver Coastal Health to obtain local data on referral rates. No

personal identifiers were included, and the data is presented without jeopardizing anonymity to maintain confidentiality. While informal team dialogue and emerging data highlighted the need to improve diabetes care services in Squamish, competing priorities throughout the COVID19 pandemic have made more structured key stakeholder engagement challenging. Management and physician groups have expressed enthusiasm to improve diabetes services but have lacked commitment to participate in planning meetings. This was frustrating as I envisioned the project to be more participatory when identifying gaps in service and planning recommendations; however, community member and key stakeholder involvement will occur once there is the opportunity, and their involvement has been outlined in the recommendations. My role allows for continued attempts to spark interest in my colleagues to improve our services by addressing gaps identified in this project and to remain accountable to our community to optimize diabetes care.

Purpose of the Project

The burden of chronic disease is considerable and requires a proactive approach to support people over long periods of time rather than reactive acute and episodic care (Reynolds et al., 2018). This long-term approach makes investing in reorienting health policy and health care for chronic conditions such as diabetes in the community and primary care a priority for innovative health care. This shift is promoted by the World Health Organization, International Diabetes Federation and Diabetes Canada and grounded in person-centred care (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; International Diabetes Federation, 2019; Reynolds et al., 2018; World Health Organization, 2002). The suspected gap in diabetes services offered in the community and rising diabetes incidence rates prompted this inquiry into diabetes care services within Squamish. The purpose of this paper is to lay the foundation for a quality

improvement project to improve diabetes care by addressing service gaps in Squamish. The theoretical lens of person-centered care underpins the work of this project. The paper includes: 1) a narrative literature review to identify elements that contribute to effective diabetes care organization and delivery in a community setting using the Chronic Care Model as a framework to organize the findings; 2) a gap analysis including local data to identify what services are currently offered by the Home Health program in Squamish, community resources outside Squamish as well as local policies and service plans; 3) recommendations for future quality improvement work including a focus group and key stakeholder meeting to address service gaps and optimize diabetes care and services for people living with diabetes in Squamish. This project is focused on community-based diabetes support and management delivered in Squamish, BC; however, there is the opportunity to expand the results and recommendations of this project to support the Sea to Sky corridor including the communities of Squamish, Whistler, Pemberton and Mount Currie.

CHAPTER 2

Background

The following section outlines the global, national and local context of diabetes. The impact and different types of diabetes are noted while type 2 diabetes is the focus and examined in greater depth. Wider global data is narrowed to the Canadian and provincial context.

Impact of Diabetes

The International Diabetes Federation (IDF) (2019) quantifies diabetes as one the fastest growing health challenges of this century with the number of adults living with diabetes having more than tripled over the last 20 years. Therefore, with approximately 9% of adults living with diabetes around the world this equates to 463 million people. This rapid increase has surpassed the original projections from the IDF (International Diabetes Federation, 2019) . In 2010, the IDF projected 438 million or 7.8% of the adult population worldwide to have diabetes in 2030, these projections have been exceeded by 2019 (International Diabetes Federation, 2009).The majority of the increase is due to type 2 diabetes (International Diabetes Federation, 2019).

Type 1 diabetes is an autoimmune disease with unknown etiology influenced by people's genotype and environmental factors (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; International Diabetes Federation, 2019). Whereas developing type 2 diabetes is influenced by several factors including obesity, ethnic background, family history, and environmental factors (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; International Diabetes Federation, 2019). Type 2 diabetes usually develops in adulthood, but it is increasingly prevalent in young adults and youth (International Diabetes Federation, 2019). The rise in related type 2 diabetes risk factors in youth and adults including unhealthy eating habits, physical inactivity and obesity correlate with this increase in prevalence (International Diabetes

Federation, 2019). Preventive medicine is not a factor in the management of type 1 diabetes since the underlying cause remains unclear; however, for type 2 diabetes the WHO clearly offers "close to 90 per cent of type 2 diabetes cases can be prevented" (Diabetes Canada, 2019, p. 2). Evidence to support strategies to prevent or even delay type 2 diabetes include: healthy behaviour interventions, such as physical activity and weight loss, certain dietary patterns and pharmacotherapy (Houlden, 2018).

Both type 1 and type 2 diabetes carry a significant disease burden, but because of the different underlying factors that influence type 2 diabetes and the greater prevalence around the globe, type 2 is the focus of this project. Self-management is a key concept to promote person-centered, culturally appropriate strategies tailored to the individual and community which is linked to both prevention and management of this chronic condition. Many factors play a role in the development and management of type 2 diabetes including social and economic factors. These examples of the social determinants of health are important elements influencing health care outcomes and ongoing patient self-management decisions (Dinca-Panaitescu et al., 2012). Factors such as social inclusion, education, and health literacy are examples of how variations in the social determinants of health can further influence health outcomes. While necessary to recognise and address the impact the social determinants of health have on type 2 diabetes care and patient outcomes, an in-depth focus on the social determinants of health is outside the scope of this paper.

The impacts of diabetes on the wellbeing of individuals, families and communities are considerable. Complications from type 2 diabetes include hypoglycemia, diabetic retinopathy, nephropathy, neuropathy and cardiovascular disease (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; World Health Organization, 2020). Furthermore, diabetes

has grave consequences on major biological systems and "contributes to 30 per cent of strokes, 40 per cent of heart attacks, 50 per cent of kidney failure requiring dialysis, 70 per cent of non-traumatic lower limb amputations and is a leading cause of vision loss" (Diabetes Canada, 2019, p. 2). Diabetes is the third highest modifiable risk factor for premature mortality after hypertension and smoking (Houlden, 2018; International Diabetes Federation, 2019). Diabetes is also closely linked to mental health conditions with 30% of individuals with diabetes at risk of developing clinical depression, and conversely people with depression have a greater than fifty percent chance of developing type 2 diabetes (Diabetes Canada, 2019; Houlden, 2018). The impact of diabetes related complications on premature mortality and quality of life also result in a significant economic impact for countries and their health care systems (International Diabetes Federation, 2019).

The International Diabetes Federation estimates global diabetes related health expenditures to result in the equivalent of 760 billion USD (International Diabetes Federation, 2019). In Canada alone, diabetes contributes to thousands of preventable hospitalizations every year (Diabetes Canada, 2019). Over an individual's lifetime, diabetes and its complications place a significant burden on Canada's publicly funded health-care system as a result of the direct cost of treatment, the increased acute and community care services use, the loss of social productivity in the workforce, and the increased need to finance pharmacological or other support aids (Houlden, 2018). Despite individual's with diabetes having access to diagnosis and treatment options as part of a publicly funded health care system, inequalities in service provision exist (Ricci-Cabello et al., 2013). The variation in treatment options available to individuals with diabetes, their caregivers and the wider community results in less than optimal care for some Canadians, especially for vulnerable and high risk groups of individuals such as Indigenous

peoples (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). This challenge is exemplified in smaller and more rural communities as diabetes education programs and multidisciplinary diabetes care teams are absent or more difficult to access when compared to larger urban centers (Ricci-Cabello et al., 2013).

Global, National and Local Context

The International Diabetes Federation (2019) quotes the global prevalence of diabetes in urban areas as 10.8% and in rural areas it is lower, at 7.2%, this gap however, is closing, with rural prevalence on the rise. In 2017, 7.3% of Canadian adults reported being diagnosed with diabetes (Statistics Canada, 2018b). In addition, Canadians have high rates of associated risk factors that contribute to type 2 diabetes: For example, only 2 out of 10 Canadians meet the Canadian physical activity guidelines and 63.1% of Canadian adults are considered overweight or obese (Public Health Agency of Canada, 2016; Statistics Canada, 2019). The prevalence of diabetes within our BC communities is consistent with these changes, it is increasing. Approximately 8% or 460,000 British Columbians have diabetes with 29,000 individuals newly diagnosed in 2017/18 (BC Centre for Disease Control, 2020). Diabetes Canada (2019) estimates the cost to the provincial health care system is an average of $509 million per annum. This rise is likely reflected in the Sea to Sky corridor within the mainly rural communities of Squamish, Whistler, Pemberton and Mount Currie.

Population data specific to diabetes rates is not available for the community of Squamish, but available for the Health Service Delivery Area of North Shore/Coast Garibaldi region from the BC Centre for Disease Control (BCCDC); this region includes the communities of North and West Vancouver, Squamish, Whistler, Pemberton, Mount Currie, Bella Coola Valley, Sunshine Coast and Powell River (BC Ministry of Health, 2018). North Shore/Coast Garibaldi covers

51,800 square kilometers with a total population of 284,000 in 2016 (Statistics Canada, 2017). Overall, North Shore/Coast Garibaldi is a healthy community with lower rates of chronic diseases such as diabetes when compared to all of BC (PHSA, 2019). In 2017/18, diabetes prevalence rates in the North Shore/Coast Garibaldi region were 6.25% compared to 8.03% for all of BC (see Figure 1) (BC Centre for Disease Control, 2020). When you consider the population of Squamish reported as 20,404 in 2019 (BC Stats, 2019) with a prevalence of 6.25%, the total number of adults living with diabetes in the community equates to approximately 1,275 individuals.

Despite having lower rates of chronic disease, in order to understand a population risk for diabetes over time, it is important to consider annual incidence rates. The incidence rate refers to the number of new diagnosis during a period of time. Interestingly, although the rise in prevalence for North Shore/Coast Garibaldi has mirrored the rise in prevalence in BC, the incidence rates are increasing at a higher rate in North Shore/Coast Garibaldi (see Figure 2) (BC Centre for Disease Control, 2020). From 2014 to 2018, the rate of diabetes increased from 4.26 to 5.5 per 1,000 people in North Shore/Coast Garibaldi (BC Centre for Disease Control, 2020). In 2019, with an incidence rate of 5.5 per 1,000 population at risk, there would be an estimated 112 people newly diagnosed with diabetes in Squamish (BC Centre for Disease Control, 2020).

Figure 1

Age-Standardized Prevalence per 100 Population for Diabetes

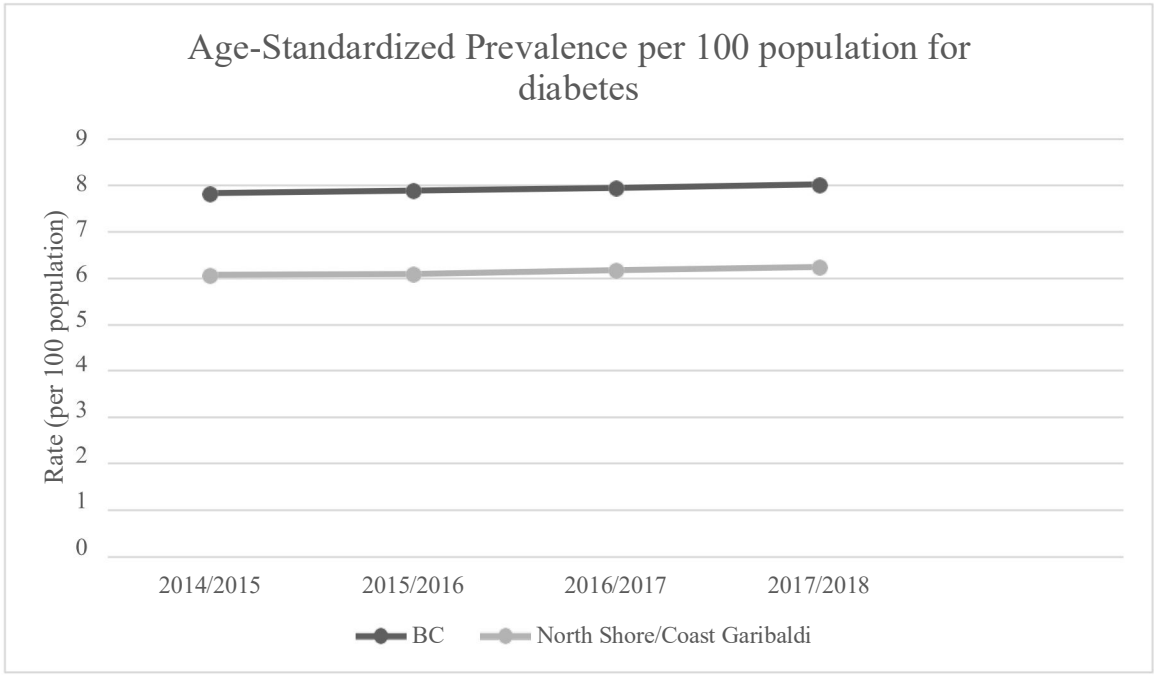
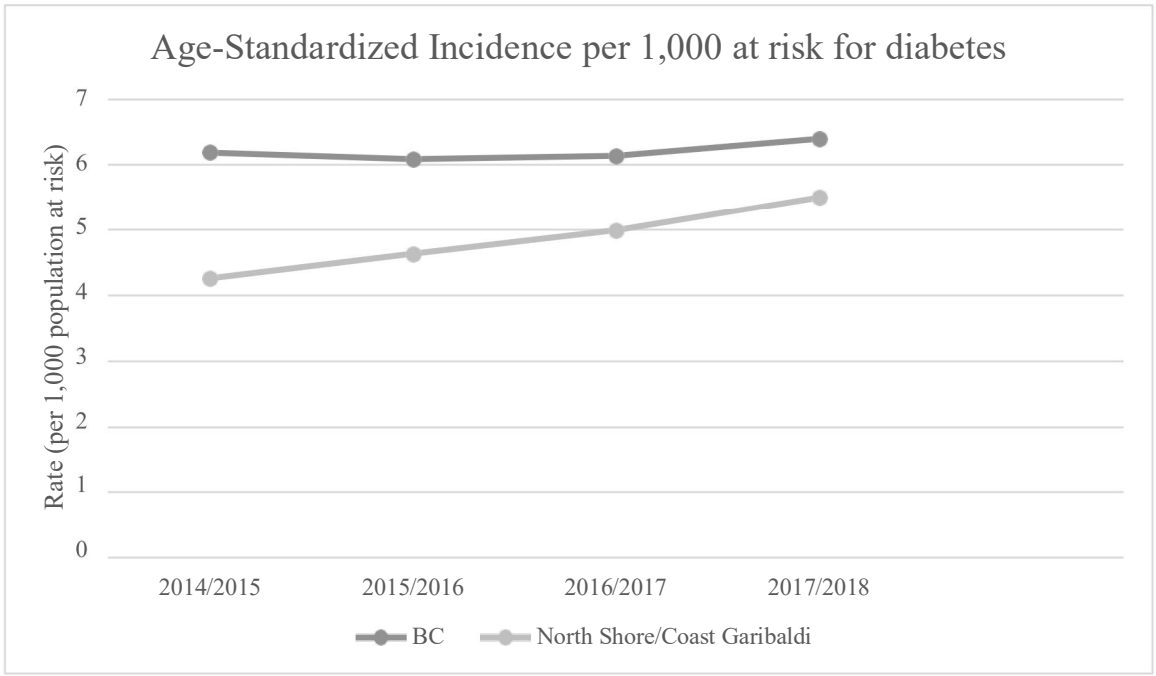


Figure 2

Age-Standardized Incidence per 1,000 at Risk for Diabetes



Note: Data was collected for the North/Shore Coast Garibaldi region as there is no data specific to the community of Squamish where the quality improvement project will be taking place. Diabetes prevalence data varies from the sources used to collect the data. The BC CDC uses data collected from the BC Ministry of Health including Registration and Premium Billing (R&PB), HealthIdeas Fiscal Year Client Roster, Medial Service Plan (MSP) Physician Billing Data, PharmaNet Drug Dispensing History, and Hospital Discharge Abstract Databases (DAD); whereas, Statistics Canada diabetes rates are collected from the Canadian Community Health Survey (Statistics Canada, 2018a). Data for figure 1 and 2 are from the BC CDC chronic disease dashboard (BC Centre for Disease Control, 2020)

The variations in prevalence and incidence demonstrate the complex nature of the disease. Furthermore, health care providers need to recognize the importance of understanding the community's needs as they may differ significantly from other community profiles and understanding the causative and contributing factors.

CHAPTER 3

Theoretical Framework

The theoretical perspective of person-centered care is a key attribute in chronic disease management (BC Ministry of Health, 2015c; Canadian Academy of Health Sciences, 2017). Yet, despite a person-centred approach being well described in health care literature, the paradigm shift from a paternalistic medical model where the patient is a passive recipient of care to an empowered active participant continues to evolves and requires deliberate inclusion when reorganizing health services (Olesen et al., 2020; Pulvirenti et al., 2014). Person-centered care is described by Epstein and Street (2011) as a "quality of personal, professional, and organizational relationships" (p 100) that requires care to be centered around the person, their families, clinicians and health systems. It is a concept promoted in clinical practice and examined in research paradigms, thereby a bridge across the theory-to-practice gap (Santana et al., 2018). Therefore, person-centered care provides a conceptual framework underpinning the current project. In this chapter, person-centered care is defined, and explored in relation to current work in chronic disease management and diabetes care to provide the theoretical context for the project. While the term person-centered is used throughout this document, various terms such as patient-centered and client-centered are used in the literature to represent the concept of care centered around the individual.

Person-centered care is grounded in the work of Carl Rogers (1951) in humanistic psychotherapy. Rogers saw the value of therapeutic relationships where the patient's capacity for self-direction was respected and nurtured. Santana et al. (2018) suggest the conceptualization of person-centered care originated with the work of Edith Balint in 1969 that acknowledged the patient as a unique individual. Person-centered partnerships promote self-esteem and self-

efficacy and are therefore key in the self-management for individuals with chronic disease (Morgan & Yoder, 2012). Person-centered, caring relationships have become central to nursing practice; however, the shift away from a paternalistic model of health systems continues to require purposeful effort and is noted as an integral concept at a global and local level.

The World Health Organization (WHO) (2016a) Framework on integrated, people-centered health services outlines the need "to reorient health services, putting individuals, families, carers and communities at their centre" (p. 3). The WHO (2016a) emphasizes the need to move away from hospital-based and curative care models in order to obtain equitable, high-quality and financially sustainable care. This shift focuses on empowering and engaging individuals thereby creating the opportunity for individuals to become active participants in their care, making choices and directing care specific to their needs.

The Canadian Academy of Health Sciences (2017) was commissioned by Veteran Affairs Canada to create a report on the best practices and new and emerging trends in the care of chronic diseases. One of the five key messages focused on patient-centered care: "patient-centered primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care" (Canadian Academy of Health Sciences, 2017, p. 3). This emphasis on the value of person-centered care for optimizing chronic disease management necessitates its inclusion when planning and implementing diabetes services.

At a provincial level, person-centered care is also central to BC's health care priorities. Person-centered care is identified as the first of eight priorities in the BC Ministry of Health Strategic Plan (BC Ministry of Health, 2014). A person-centered care framework was created by the BC Ministry of Health (2015b) "to build on existing efforts and accelerate the adoption of

patient-centered care practices in B.C. by creating a common understanding of what patient-centered care is and a shared vision for adopting patient-centered care" (BC Ministry of Health, 2015c, p. 1). Adopting person-centered care means shifting current health system priorities from disease-centered and provider-focused to person-centered care (BC Ministry of Health, 2015c). The framework is built on the principles of dignity and respect, information sharing, participation and collaboration.

A distinction between person-centered care and patient-centered care is important because person-centred care honors the notion of the person, from a holistic perspective including the person's context, preferences and beliefs (Santana et al., 2018). Whereas patient-centered care reduces the person to their role as patient with a focus on their illness or disease (Santana et al., 2018). Santana et al. (2018) created a conceptual framework to support health care organizations to integrate person-centered care into practice. The framework identifies practical implementation strategies to reorient health system structures and health care provider interactions resulting in high quality person-centered care and improved health-care system efficiency and effectiveness (Santana et al., 2018). In order to prevent losing sight of the person in the service, strategies include creating a person-centered culture that values patient engagement, co-designing education and health promotion programs with key stakeholders and community members, integrating clinical information systems to coordinate and share information across providers and patients, engaging patients in the management of their care through shared decision-making and setting goals, cultivating respectful communication through listening and sharing information, and creating culturally sensitive care that respects the beliefs and preferences of individuals (Santana et al., 2018). When integrating a person-centered approach to care, the impact on outcomes can be measured with Patient-Reported Outcome

Measures (PROMs), Patient-Reported Experience Measures (PREMs) and Patient-Reported Adverse Outcomes (PRAOS) (Santana et al., 2018).

Even with good intentions, it is easy to develop programs or organize care around the needs of the provider or to accommodate the current system in which care takes place. Therefore, there is a need to overtly acknowledge adopting a person-centered approach to avoid system or provider focused models of care. This creates the opportunity for improved patient care experiences and improved chronic disease management (Olesen et al., 2020; World Health Organization, 2016a).

CHAPTER 4: NARRATIVE LITERATURE REVIEW

Methods

The intent of a narrative literature review is to describe and synthesize key literature pertaining to a specific area of interest (Green et al., 2006). A narrative literature review methodology was chosen for this project since the goal was to identify and summarize best practice regarding the organization of diabetes care in a community setting. A narrative literature review is not a formative appraisal of the evidence typical in a systematic review, but a synthesis of peer reviewed evidence-based literature collated to describe the current state of knowledge, practice, or care delivery (Ferrari, 2015). Further, a narrative review has a place in emerging quality work since this approach has value in education by providing the audience with up-to-date knowledge about a specific topic, here type 2 diabetes care in rural contexts in BC, Canada. Therefore, narrative methodology was used since the focus of the project was to compare the current state of diabetes care in the community of Squamish with current best practice standards and governing principles in type 2 diabetes management, in order guide future local service improvements. A systematic approach to examining the literature was adopted in order to ensure that peer-reviewed literature and grey literature informed future discussions.

The first step in writing a narrative overview is to perform a preliminary search of the literature to identify work published on diabetes care management in the community. An initial literature search was conducted using CINAHL, Medline, and PubMed. The term ‘diabetes’ was used with the Boolean operator AND with the terms ‘service delivery’, ‘care delivery’, ‘organization’ or ‘integrated’; AND/OR ‘model’, ‘framework’; AND/OR ‘community’, ‘community health’ or ‘home health’. The search was limited to articles in English from January 2010 to September 2020. The initial search yielded thousands of results; therefore, the search

was narrowed by focusing on systematic and integrative reviews, as well as grey literature from the World Health Organization, Improving Chronic Illness Care and Diabetes Canada. The initial search resulted in identifying the Chronic Care Model as the most prevalent and widely adopted model to organize diabetes care and services in the primary and community care settings with improved outcomes for diabetes management (Clement et al., 2018; Wagner et al., 1999, 2001). It provides a comprehensive framework focused on preventative, person-centered, community-based and integrated approaches to care (World Health Organization, 2016b). The six domains of the Chronic Care Model provide a framework to organize the findings of the literature review and base quality improvement work; the six components include: self-management, delivery system design, decision support, clinical information systems, community resources and health system organization (Wagner et al., 2001).

First level screening included reading the title and abstract with a focus on the term 'type 2 diabetes' and 'chronic care model'. Second level screening was completed for relevance based on the title and then abstract to focus on the articles related to the organization of type 2 diabetes care and the Chronic Care Model in a community setting. Key documents were also identified in the grey literature from multiple sources including: Diabetes Canada; World Health Organization, and the International Diabetes Federation. These are examples of organizations with comprehensive pieces of literature that have undergone their own systematic reviews of current research on diabetes care. Citation searching was used to identify relevant literature based on key themes and concepts, as well as, to identify original sources. A preference was chosen for articles based in Canada and they were reviewed for relevance to the project objectives. See table 1 for inclusion and exclusion criteria.

Table 1.

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• Type 2 diabetes • Adults – age >19 years • Chronic Care Model elements • Diabetes service delivery, design or organization • Primary or community care settings • Peer reviewed articles, systematic reviews, integrative reviews or key documents from WHO, IDF, Diabetes Canada, Government of Canada, BC Ministry of Health, or Vancouver Coastal Health. • Articles from 2010-2020 with the exception of original works from outside this date range.	• Other types of diabetes including type 1 and gestational diabetes • Diabetes inpatient services • Surgical services • Ophthalmology

The literature search was an iterative and intuitive process as key search terms were identified, reviewed, refined and searched again. The results were organized through a narrative synthesis into the 6 components of the Chronic Care Model.

Findings

After screening and identification, 26 articles were included in the narrative review. In depth review of the selected papers are discussed in the following section. Thirteen of the studies were systematic reviews, integrative or scoping reviews. The references ranged from 2010 to 2020 and most were conducted in Western countries. The Chronic Care Model is the most commonly referenced model for chronic disease management and more specifically for diabetes care (Grover & Joshi, 2015). Ten references reviewed the outcomes of implementing one or all of the elements of the Chronic Care Model (Alharbi et al., 2016; Baptista et al., 2016; Bongaerts et al., 2017; Busetto et al., 2016; Elissen et al., 2013b; Grover & Joshi, 2015; Lim et al., 2018;

Reynolds et al., 2018; Ricci-Cabello et al., 2013; Stellefson et al., 2013). A number of the references did not specifically refer to the Chronic Care Model but evaluated individual interventions found withing the Chronic Care Model for chronic disease management such as self-management support or integrated care (Chrvala et al., 2016; Forbes et al., 2011; O'Brien & Hardy, 2003; Penn et al., 2015; Siminerio et al., 2014).

Other key documents include the original articles outlining the Chronic Care Model (Wagner et al., 1999, 1996, 2001); the Diabetes Canada 2018 Clinical Practice Guidelines (Clement et al., 2018; Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018; Sherifali et al., 2018); the Review of Chronic Care (Canadian Academy of Health Sciences, 2017) and the World Health Organization Framework on integrated, people-centered health services to provide global context for the organization of health services (World Health Organization, 2016a). This broad selection of literature was to obtain an overview of how diabetes services are organized. A more detailed review of the papers is noted in Appendix A: Narrative Literature Review Matrix.

The narrative review findings are organized using the Chronic Care Model. The six elements of the Chronic Care Model provide a framework for best practice to organize diabetes care and services and to focus quality improvement work. Not all studies evaluating diabetes management refer to the Chronic Care Model or include all 6 elements of the model; however, the majority of interventions to optimize chronic disease services and care can be categorized within one of the six major components of the Chronic Care Model. For this reason, the Chronic Care Model was selected to organize the literature findings.

Chronic Care Model

There are various models to support the improvement of chronic care; however, Wagner's (2002) Chronic Care Model is the most widely accepted and adopted (Canadian Academy of Health Sciences, 2017; Grover & Joshi, 2015; Improving Chronic Illness Care (ICIC), 2020). Wagner et al. (1999) worked with support from the Robert Wood Johnson Foundation to develop a guide to chronic care improvement; the result was the Chronic Care Model. The model became an integral part of the US National Improving Chronic Illness Care program and involved a large number of diverse health care delivery organizations which provided the original evidence supporting the adoption of the model to improve outcomes in chronic disease management (Wagner et al., 2001). Variations of the Chronic Care Model exist as research projects and organizations tailor the elements of the framework to best meet their needs, but this paper is focused on the original version by Wagner et al. (1999, 2001).

The majority of the care for people with diabetes occurs in the primary care setting and the Chronic Care Model provides the framework necessary to structure an evidence-based redesign to encourage high-quality chronic disease care and quality improvements opportunities (Canadian Academy of Health Sciences, 2017; Clement et al., 2018).

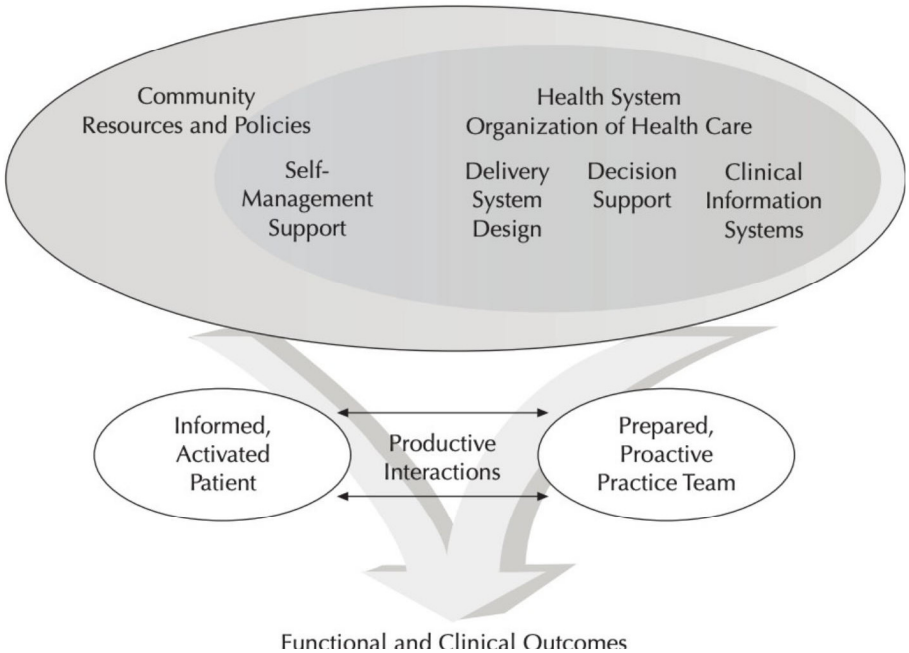
The Chronic Care Model includes six components: 1) self-management; 2) delivery system design; 3) decision support; 4) clinical information systems; 5) community resources; and 6) health system organization (see Figure 3) (Wagner et al., 1999, 2001). These components work together to create high quality chronic disease care (Barr et al., 2003; Clement et al., 2018). The Chronic Care Model provides an integrated approach to care (World Health Organization, 2016b). A systematic review of chronic disease management interventions in primary care supports the Chronic Care Model as the most frequently used model associated with statistically

significant improvements for diabetes management (Grover & Joshi, 2015; Reynolds et al., 2018). There is a significant amount of literature evaluating one or more components of the Chronic Care Model for diabetes care with positive results including decreased hemoglobin A1C (HbA1C) levels (Barr et al., 2003; Clement et al., 2018). Diabetes Canada advocates using the Chronic Care Model as the organizational framework to address the changes required to better meet the goals outlined in the evidence-based guidelines (Clement et al., 2018; Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018).

The 6 components of the Chronic Care Model provide a focus for quality improvement work (Clement et al., 2018). These elements are evidence-based and have been shown to improve care (Clement et al., 2018; Improving Chronic Illness Care (ICIC), 2020).

Figure 3

A Model for Effective Chronic Illness Care



Wagner et al. (2002). A survey of leading chronic disease management programs: Are they

consistent with the literature? *Journal of Nursing Care Quality*, *16*(2), 67–80. Reprinted with permission from Wolters Kluwer Health Inc.

Self-Management

Self-management education and support is a critical component of diabetes management (Sherifali et al., 2018). It is a prevalent theme in the majority of literature on chronic disease management and diabetes care, and highlighted in the Chronic Care Model (Barr et al., 2003; Grover & Joshi, 2015; Olesen et al., 2020; Penn et al., 2015; Reynolds et al., 2018; Sherifali et al., 2018). Self-management is a complex concept. It is a critical factor in achieving positive patient outcomes and is linked to health literacy and service delivery. Self-management in type 2 diabetes includes: self-monitoring blood glucose levels, healthy eating, physical exercise, pharmacotherapy, prevention and management of hypoglycemia, prevention and surveillance of complications, stress management and relaxation techniques, coping strategies, and goal setting (Sherifali et al., 2018). These can be delivered in variety of settings by a variety of methods.

There is variation in the language and meaning associated with self-management which allows for specificity. For example, the terms self-management, self-management education and self-management support are used interchangeably, but there are differences between the education and support of self-management. Diabetes Canada delineates between the two terms because of the growing evidence reinforcing the necessity to include self-management education with support for optimal results (Sherifali et al., 2018). Self-management education "is defined as a systematic intervention that involves active participation by the individual in self-monitoring of health parameters and /or decision-making with the application of knowledge and skills" (Sherifali et al., 2018, p. S36). Whereas self-management support "includes activities that support the implementation and maintenance of behaviors for ongoing diabetes self-

management, including education, behaviour modification, psychosocial and/or clinical support" (Sherifali et al., 2018, p. S36). It is important to differentiate between the two types of self-management when planning diabetes services in an effort to meet both self-management objectives: 1) education to guide self-monitoring and decision-making, and 2) support to sustain behaviors.

The evidence supporting the benefits of self-management education include: improved glycemic control, improved cardiovascular risk factors, and reduced foot related complications (Chrvala et al., 2016; Sherifali et al., 2018). However, glycemic control is the most consistently evaluated outcome. For example, the systematic review of 118 unique randomized controlled trials (RTCs) by Chrvala et al. (2016) evaluated the impact of diabetes self-management education on improving HbA1C results. The overall mean reduction in HbA1C for participants in the intervention groups who received various types of self-management education was 0.74 compared to a mean decrease of 0.17 for the control groups who did not received self-management interventions. Out of the 118 RCTs evaluated, 61.9% of interventions resulted in statistically significant reductions in A1C (Chrvala et al., 2016). A combination of group, individual and remote diabetes self-management education achieved the greatest improvements in outcomes compared to individual or group education alone (Chrvala et al., 2016).

Self-management education was more effective when delivered by a multidisciplinary team that included a nurse who has received specific diabetic educator training (Chrvala et al., 2016; Sherifali et al., 2018). Although there appears to be no agreed upon ideal length of session, frequency, or duration of program, the systematic review by Chrvala et al. (2016) identified statistically significant changes in HbA1C to be greater for self-management education interventions with greater than 10 hours of contact time. The integrative review by Olesen et al.

(2020) identified multiple studies where positive outcomes were achieved through group-based self-management programs. The authors found the peer support from group-based programs enhanced diabetes management and suspected personal sharing and group interactions led to maintaining motivation (Olesen et al., 2020). Improvements in HbA1C were more likely to be maintained when self-management support was added to the education (Sherifali et al., 2018).

In addition to peer support noted by Olesen et al. (2020), other methods of providing self-management support resulting in reduction of HbA1C levels include follow-up telephone calls from a diabetes educator at least 4 times per year and ongoing support from community health workers (Sherifali et al., 2018). For long term change to be sustainable, self-management support should include cognitive behavioral therapy interventions to increase participants personal awareness of the barriers and promoters for personal change (Sherifali et al., 2018).

Delivery System Design

In order to achieve high quality chronic illness care, team-based multidisciplinary care is essential to the delivery system design (Wagner et al., 2001). Diabetes care demands planning and coordinating the actions of multiple care providers; therefore, effective multidisciplinary teams are key to improvements in care. Team-based cared is not a new concept, but chronic care continues to be delivered primarily by primary care physicians, especially in rural or remote areas (Gucciardi et al., 2015).

The value of multidisciplinary team-based care was emphasized in the 2002 Romanow Report, and it continues to be prominent in the literature on chronic disease management (Romanow, 2002; World Health Organization, 2016a). The World Health Organization (WHO) (2016a) calls for multidisciplinary teams to provide comprehensive care to better meet population health needs. Barrett et al. (2007) reported multidisciplinary models provide a broader

range of services, coordination of care and better access to services resulting in more efficient use of resources, greater patient satisfaction, improved self-care and improved provider job satisfaction (Barrett et al., 2007). Enhanced interprofessional collaboration as part of integrated care systems is especially relevant for groups such as individuals with chronic disease who require the integration of multiple providers and services (Barrett et al., 2007; Siminerio et al., 2005). The terms multidisciplinary, interprofessional, and interdisciplinary are used interchangeably in this paper and throughout the literature; there are subtle differences in the terms, but that discussion is beyond the scope of this paper.

Diabetes Canada supports the integration of team-based care for diabetes care and management because "patients who are part of interprofessional teams have better outcomes and fewer hospital visits than patients who are not" (Clement et al., 2018, p. S28). Diabetes Canada emphasizes the importance of members of the interprofessional team having specific training in diabetes and work collaboratively with the primary care provider (Clement et al., 2018). Team members may include physicians, nurses, nurse practitioners, dieticians, pharmacists and providers of psychological support (Clement et al., 2018). Case management led by a nurse or dietitian with specialty diabetes training has been reported to improve both glycemic control and cardiovascular risk factors (Clement et al., 2018; Wagner et al., 2001). The role of the case manager often includes self-management support and education, close follow-up to assess response to therapy and the adjustment of treatments using guidelines and protocols.

Szafran et al. (2019) found family physicians who were part of multidisciplinary primary care networks reported involving other health care professionals in the care of their patients with diabetes more than physicians who worked in traditional family practice environments. Providers in the primary care network also perceived improved patient care from the interdisciplinary

involvement such as by more time allocated to teaching self-care and monitoring and adjustment of diabetic medications (Szafran et al., 2019).

One of the barriers to implementing multidisciplinary teams includes most primary care services do not support renumeration for team-based care. For example, fee for service is often tied to a particular care provider such as the physician (Canadian Academy of Health Sciences, 2017). Other barriers to implementing collaborative practice include the providers' willingness to overcome traditional professional roles, and their ability to adapt to the changes and challenges associated with sharing patients, space, and costs (Gucciardi et al., 2016; Szafran et al., 2019). Gucciardi et al. (2016) affirm government resources and educational support need to be provided where multidisciplinary collaboration is a fairly new process. This would ensure the team has the knowledge and skills required for interprofessional collaboration and result in positive outcomes for providers and patients.

Decision Support

Decision support refers to the integration of evidence based guidelines into care (Clement et al., 2018; Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). Wagner et al. (2001) affirm guidelines become effective change agents only when they can be successfully integrated into routine practice. Guidelines can be incorporated in a variety of ways such as embedding them in a patient registry, using flow sheets, and in patient assessment and documentation tools (Baptista et al., 2016; Stellefson et al., 2013; Wagner et al., 2001). These tools prompt providers to refer to the guidelines during key interactions or interventions. It can be challenging to change existing practice; therefore, system alerts, reminders, and audit and feedback are useful to support change when integrating guidelines (Baptista et al., 2016; Clement et al., 2018).

The systematic review by Stellefson et al. (2013) identified training for providers on evidenced-based guidelines and the methods for implementing the Chronic Care Model resulted in better adherence to clinical practice guidelines, and improved HbA1C levels and cholesterol markers. In addition to better adherence to guidelines, Stellefson et al. (2013) reported investing the resources to support providers in implementing evidence-based guidelines resulted in better informed and more engaged providers which the authors suspected led to improved patient engagement and positive health outcomes. The key to guidelines having an impact on quality of care is their integration throughout all decision-support interventions including during provider interactions, specialist involvement, and guiding education and case management activities with evidence-based treatment algorithms (Clement et al., 2018). Interactive computer technology creates the opportunity for best-practice information to be available at point of care to support decision making.

Telemedicine is an innovative decision support strategy that has the power to expand the reach of health care by enabling providers and patients to have access to a greater variety of resources and care (Alharbi et al., 2016; Dorsey & Topol, 2016; Siminerio et al., 2014). This is especially true for areas that are geographically isolated. Telemedicine, also known as telehealth, is a quality improvement strategy with evidence for improving glycemic control and cardiovascular risk factors in people with diabetes (Clement et al., 2018; Riazi et al., 2015). Clements et al. (2018) found the frequency of contact with clients has been shown to be important when managing diabetes in the community and telehealth may facilitate regular contact especially in a rural setting where access to resources may be limited. Telehealth can be used for conferencing with health care team members, education in an individual or group setting, consultations with specialists, and optimizing self-management.

For example, mobile apps are an accessible and often inexpensive tool people can utilize to support their health and wellbeing. Many glucose meter companies now have apps that allow easy downloading, trending and sharing of blood glucose levels and can act as an adjuvant to support diabetes management (Doyle, 2020). A systematic review by Hou et al. (2016) concluded mobile phone apps can be effective at improving glycemic control. The authors reported a reduction in HbA1C for participants in all 10 of the studies examined specific to type 2 diabetes (Hou et al., 2016).

In addition to mobile apps, other telehealth technologies have proven effective for diabetes self-management such as computer and web-based interventions, and social networking services (Clement et al., 2018; Hou et al., 2016). One of the barriers to using telemedicine is the technological literacy of patients and providers (Siminerio et al., 2014), and the lack of standards or policies to help guide programs looking to integrate telehealth apps for self-management support (Hou et al., 2016).

Clinical Information Systems

Clinical information systems organize and store user data to facilitate efficiency and effectiveness of the health care system (Wagner et al., 2001). In chronic disease management, clinical information systems allow for a population-based approach to diabetes management and include Electronic Medical Record (EMR) systems and patient registries (Clement et al., 2018). Patient registries and EMRs have been shown to have a positive impact on diabetes care (Baptista et al., 2016; Bongaerts et al., 2017; Clement et al., 2018; Stellefson et al., 2013; Wagner et al., 2001). The systematic review by Riazi et al. (2015) indicates clinical information system technologies are associated with a decrease in HbA1C levels. Clinical information systems allow multiple providers to monitor and deliver care. These systems provide access to

diagnostic results and examination records to foster collaborative and integrated services, as well as, identify gaps in care (Clement et al., 2018; Stellefson et al., 2013). Sites using EMRs for diabetes care in the USA achieved better diabetes outcomes than sites that were paper-based (Clement et al., 2018). Patient registries allow for tracking diabetes trends, benchmarking, and evaluating quality improvement work which are all key to improving diabetes care services (Clement et al., 2018).

Barriers to implementing clinical information systems in diabetes care include a higher cost at initial implementation, challenges for health care providers in technological literacy, and the perception by providers or patients that providers are spending more time with the computer system than the patient (Riazi et al., 2015).

Community Resources

Improving Chronic Illness Care (2020) highlights the value of health systems looking beyond themselves as many useful community resources exist and can enhance chronic illness management. Wagner et al. (2001) recognized this benefit and included community resources in the Chronic Care Model Framework. Creating linkages with effective programs in the community is a cost-effective way to deliver a variety of services beyond what the health organization is able to offer and maintain (Wagner et al., 2001). However, few studies were found with a focus on the Chronic Care Model and diabetes care addressed through community resources and policies (Baptista et al., 2016; Reynolds et al., 2018; Stellefson et al., 2013). Peer led self-management support groups have been shown to be effective in improving diabetes outcomes; therefore, this would be excellent community based resource to identify and partner with the existing health care system services (Clement et al., 2018). Stellefson et al. (2013) identified the need to create more community partnerships to address barriers to care and include

culturally appropriate services. For example, utilizing existing community exercise programs or cooking classes is a potentially effective strategy to tailor care to the sociocultural preferences of the community and to avoid unnecessary duplication of services. Partnering with community services is especially important for smaller organizations or rural health service areas with limited resources such as Squamish (Ricci-Cabello et al., 2013; Wagner et al., 2001). Barriers to integrating community resources outside current health systems include the challenge of shifting away from traditional health care models with siloed services, and the lack of awareness of what services exist in the community that align with diabetes management best practices.

Health System Organization

Health system organization represents how the care and services supporting diabetes management is organized at a system level. The Chronic Care Model views health systems as part of the larger community (Wagner et al., 1999). For health services to better support chronic disease management, chronic illness improvements must be included in the organization's goals or plan (Ricci-Cabello et al., 2013; Stellefson et al., 2013; Wagner et al., 2001). The systematic review by Reynolds et al. (2018) identified a lack of studies with interventions focused on health system organization, yet this is a key factor in the overall success and commitment to optimizing diabetes care (Clement et al., 2018; Wagner et al., 2001). Fostering change at a systems level is much more challenging than implementing a site-specific self-management program as part of a quality improvement initiative based on the Chronic Care Model. However, this type of change is what is being asked at a global level. The World Health Organization (2016a) calls for the need to integrate health services in order to optimize care.

The World Health Organization (2016b) defines integrated care as the coordination of health services across the continuum of care. Integration is a key concept at the global level to

support improvements in health care to improve the quality of patient care and control costs; it requires a person-centered approach where there is collaboration between providers and between provider organizations (Desmedt et al., 2016; World Health Organization, 2016b). It is driven by the triple aim approach of: 1) cost savings, 2) better patient care experience, and 3) improved health outcomes (Desmedt et al., 2016). The increasing prevalence of chronic disease and escalating health care costs has prompted a shift away from the current emphasis on acute care towards "prevention, self-care, more consistent standards of primary care, and care that is well co-ordinated and integrated" (Goodwin et al., 2012, p. 2). Integrated care should be directed at services and populations that would benefit the most such as people with chronic diseases (Goodwin et al., 2012).

Primary Care Networks are an example of integrated health systems. The concept of primary care networks (PCN) is currently being adopted in Alberta and BC. It is a promising model with the structure to integrate team-based services with the primary care provider to optimize diabetes care in the community setting (General Practice Service Committee, 2020). PCNs were implemented in Alberta beginning in 2003 as a strategy to improve access to care and access to multidisciplinary teams for patients with chronic disease (Manns et al., 2012). The implementation of PCNs across BC is still in its infancy. Manns et al. (2012) evaluated the outcomes for patients with diabetes enrolled in PCNs and found they had lower rates of diabetes-specific ambulatory care sensitive conditions, were more likely to see the ophthalmologist or optometrist and had better glycemic control. The difference was small, but patients with diabetes managed in PCNs had better clinical outcomes with lower rates of hospital admission and emergency department visits (Manns et al., 2012). Another benefit noted in the study, includes an increase in adherence to clinical guidelines by the primary care provider including laboratory

and retinal screening, as well as, medication management (Manns et al., 2012). PCNs have similar features to Ontario's family health teams and patient-centered medical homes; they all have similar goals to improve access to care and to coordinate or integrate care (Manns et al., 2012).

Some of the challenges associated with the implementation of integrated care models such as PCNs include a reluctance from physicians to participate due to predominant professional cultures and behaviours, an overreliance on electronic medical records as key to transformational change, a lack of focus on the population that would benefit the most, and a lack of support from the organization for change management (World Health Organization, 2016b).

Other models such as the Innovative Care for Chronic Conditions (ICCC) model supported by the World Health Organization embody similar underlying theories or concepts to the Chronic Care Model such as preventative proactive care, integrating care and creating partnerships between community, health systems and the people using them, using clinical practice guidelines and evidence-based changes (Canadian Academy of Health Sciences, 2017; World Health Organization, 2002). This model can also be applied to a variety of chronic conditions and health care settings. The World Health Organization (2016b) concludes there is no single best model for integrated care. Integrated care is contextually bound and should focus on improving the quality of care for the individuals and communities it serves.

Discussion

The organization of diabetes care is complex and multifaceted. Identifying where to begin when attempting to reorient care is an overwhelming process. However, by organizing interventions within the Chronic Care Model, a framework is created for a comprehensive and

systematic approach to restructure current models of care. Stellefson et al. (2013) found no single component was imperative for improved outcomes, but it was the combination of components or incorporating multiple components together that resulted in optimal outcomes.

The element of the Chronic Care Model most frequently attributed with statistically significant improvements was self-management support (Alharbi et al., 2016; Reynolds et al., 2018). Both delivery system design and then decision support showed evidence of benefit but should be explored in combination with other elements of the Chronic Care Model to optimize improvements (Reynolds et al., 2018). When examining combinations of elements, self-management support and delivery system design interventions were the most frequent combination of elements associated with significant improvements in outcome measures, followed by self-management support and decision support (Reynolds et al., 2018). Regardless which elements of the model are selected for quality improvement work, every component must be viewed through of lens of person-centered care and the local context to be successful in optimizing health outcomes. The local context will be explored further in the next chapter, chapter 5: the gap analysis findings and discussion.

People with diabetes represent a diverse and heterogeneous group. People from diverse geographical, cultural and socioeconomic groups are affected by this chronic disease (Houlden, 2018; International Diabetes Federation, 2019). Rigid guidelines may not incorporate the uniqueness of the individual especially when attempting to support changes in behavior and lifestyle (Houlden, 2018). Care must be tailored to meet the needs of the individual within their sociocultural context by purposefully interweaving person-centered care in all elements of system redesign. The theoretical perspective of person-centered care often underpins the literature on diabetes even when it is not explicitly outlined.

A person-centered approach is evident throughout the Diabetes Canada Clinical Practice Guidelines (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). One of the guiding principles repeated throughout the guidelines states care should be "organized around the person living with diabetes and their supports" (Clement et al., 2018, p. S27). The guidelines emphasize the importance of people with diabetes to be active participants in their own care. This is evident in the simple, readable language directed at the person with diabetes and the use of the pronoun 'you' instead of 'they' or 'the person with diabetes' used in the 'Key Messages for People Living with Diabetes' at the beginning of each chapter (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). These key messages directed at people living with diabetes set the tone and empower people to be at the center of their care and begin to shift the ownership to the individual rather than the care provider (Clement et al., 2018; Houlden, 2018).

The chapter on Nutrition Therapy in the Diabetes Canada Clinical Practice Guidelines (2018) is one example that emphasizes the importance of individualized care in self-management. Nutrition therapy is a critical aspect of diabetes care and can be used to prevent and treat acute and long-term complications. Nutrition therapy can improve glycemic control and contribute to weight loss, a key strategy in managing type 2 diabetes (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). Person-centered nutrition therapy is necessary when addressing the rich ethnocultural diversity in Canada, there is no singular dietary strategy that would meet the distinct dietary patterns, foods and dining habits of all Canadians.

Penn et al. (2015) reported patients wanted more choice in the nature and content of their self-management support. Diabetes self-management education and support appears inherently person-centered; however, diabetes self-management education and support programs can be inadvertently more teacher-centered rather than person-centered (Olesen et al., 2020). Providers

who facilitate self-management education and support must be knowledgeable in diabetes care and management while tailoring the education to the individual and/or group; this includes considering cultural preferences and individuals choices (Olesen et al., 2020; Sherifali et al., 2018). Achieving a balance between delivering the required information to successfully manage type 2 diabetes and individualizing the self-management education overlaps with person-centered care approaches. Baptista et al. (2016) outlined the central role of the patients in setting priorities and creating plans of care to best support self-management. This collaborative approach where the patient becomes an active partner is key to person-centered care. In the integrative review by Olsen et al. (2020), the authors identified person-centered interventions that lead to positive outcomes: "1) empowerment-based educational approaches to set personal goals and plan actions; 2) self-efficacy theory to develop skills, confidence and knowledge required for diabetes self-management; 3) motivational interviewing as an approach for HCPs to build rapport, ask questions and understand participants' needs and preferences; and 4) person-centred values, such as a non-didactic and collaborative patient–provider relationships" (p. 920). Olesen et al. 2020 reported person-centered self-management interventions were successful in improving psychosocial outcomes and glycemic control, yet less successful in creating behavior and lifestyle changes such as diet and exercise; they did note there were no negative consequences. The success of person-centered approaches depends on the health care providers' communication and facilitation skills; therefore, training to promote collaborative relationships and to integrate patient preferences and goals are required for positive outcomes (Olesen et al., 2020; Pulvirenti et al., 2014).

Multidisciplinary teams geared towards meeting the unique needs of the individual with type 2 diabetes reflect person-centered delivery system design. Case management allows one

provider the ability to review and organize care for patients based on the individual's unique goals within the clinical practice guidelines (Clement et al., 2018). Case managers can link individuals to the resources best suited to their collaborative plan for disease management such as the dietitian for nutrition management or the physiotherapist for individualized exercise programs. It is impossible for primary care providers to be aware of all the community resources available for all chronic conditions and health and wellness programs, but a case manager specific to diabetes care has the ability to be knowledgeable of community resources specific to diabetes and therefore has the ability to link patients with beneficial resources that already exist in the community setting.

Telemedicine is developing rapidly and there is no singular technology or method that appears superior which makes selection of the type of technology challenging and how to best apply it (Clement et al., 2018; Hou et al., 2016). The application of telehealth to diabetes management may require deliberate and careful planning to meet the intended goals of the technology, but with such positive results from the literature, it is a tool that should be considered for all diabetes care and management where appropriate.

Strategies such as automatic reminders via email or text, peer support groups, web-based culturally sensitive exercise or diet programs, diabetes coaching or telemedicine are all creative modalities with the potential to augment diabetes care and management (Hou et al., 2016; Mignerat et al., 2014; Sherifali et al., 2018). Integrating these modalities into care involves a person-centered approach to health system organization, delivery system design, and clinical information systems. One method may not be effective for a specific group or individual necessitating a person-centered approach for success. As quality improvements efforts begin in

one element of the Chronic Care Model, it becomes clear how the 6 elements are interrelated and the increased value in making improvements in more than one component.

One of the challenges associated with evaluating the effectiveness of the Chronic Care Model is the heterogeneity between the various studies including which components of the model were selected to be evaluated, and the consistency with how outcomes are measured. However, overall, systematic reviews from North America and Europe have found when more than one element of the Chronic Care Model is implemented to support the redesign of care, positive results have been extensively documented such as improved patient outcomes, quality of care and cost savings (Bongaerts et al., 2017; Clement et al., 2018; Elissen et al., 2013a; Stellefson et al., 2013; World Health Organization, 2016b). A version of the Chronic Care Model suggested to better integrate population-based health promotion and prevention by addressing the social determinants of health is the Expanded Chronic Care Model by Barr et al. (2003). Despite the benefits of attending to the broader elements of population health and wellbeing by generating new and novel approaches to the Chronic Care Model, creating new versions of the model can make consistent implementation and evaluation of results challenging. The elements of the Chronic Care Model are broad concepts that allow space for interpretation and application to a variety of settings.

Comparing results from systematic reviews on self-management education and support was especially challenging because of the heterogeneity of the methods used to deliver self-management care and the outcome measures collected. This is important to note because of the emphasis placed on the value of self-management. Therefore, clear guidelines based on evidence should be available to guide quality improvement initiatives to ultimately improve care. The challenge to accurately consolidate studies and compare results was noted by Chrvala et al.

(2016) and Olesen el al. (2020). Variations in the severity and complexity of disease as well as individuals' capacity for self-care also result in difficulties with generalization across populations. The contextual nature of patients with type 2 diabetes influences study endpoints which result in personal successes that are not transferable to a wider population with type 2 diabetes. The challenge with these differences may not be remedied with standardized approaches and evaluation measures because of the individualized nature of diabetes management. Self-management requires a person-centered approach and outcomes measures beyond glycemic control.

Another challenge identified in the review of literature was that although studies used a variety of indicators such as cholesterol levels, weight, patient satisfaction, and self-efficacy tools such as the Diabetes Empowerment Scale, HbA1C was the most consistently used and compared. This limits the ability to measure the success of other important outcomes such as quality of life and compare or synthesize results between studies. Without a consensus on what measures are collected, it will continue to be challenging to obtain consensus on what interventions are of most benefit in the management of diabetes care in the community. This in turn, makes it challenging to create best practice guidelines on how to best optimize care. Despite these challenges, the Chronic Care Model provides an evidence-based framework to focus quality improvement work in diabetes care. In the next chapter, the local context of diabetes care and management services is outlined.

CHAPTER 5: GAP ANALYSIS

The gap analysis provides an overview of the current state of diabetes care and services in the community setting of Squamish, BC. The gap analysis includes local data and an environmental scan. The goals of the analysis include: 1) identifying the current state of diabetes care provided by the Home Health program in Squamish, 2) identifying guidelines, policies and plans directing local diabetes care and services, and 3) creating partnerships with community resources outside the Squamish Home Health program to potentially address service gaps.

The Canadian agency for drugs and technologies in health CADTH (2015) describes the purpose of the environmental scan report as a tool to provide a current overview of what exists in relation to a specific topic and does not evaluate or provide recommendations. Therefore, the goal was to begin to gather information about what is available and was not intended to be a comprehensive evaluation of such services. CADTH also supports the environmental scan as a process to establish networks with key stakeholders. It provides a snapshot of what is currently taking place and identifies potential options to bridge the gaps in the current services offered through the Home Health program. The results of the environmental scan along with the findings of the literature review create the foundation for the recommendations outlined in chapter 6.

Local Context

Squamish is a rural community situated halfway between Vancouver and Whistler with a population of 20,404 in 2019 (BC Stats, 2019). The community has experienced significant population growth in the last decade with a population of 15,554 in 2011 and 17,587 in 2016 (Statistics Canada, 2017). Population growth continued until 2018, followed by a small population decline of 2.6% from 2018-2019 (BC Stats, 2019; District of Squamish, 2015). The median age for total number of residents is 37.6 compared to 43.0 for BC (Statistics Canada,

2017). The demographic is currently young with a greater percentage of the population under the age of 15 years compared to greater than 65 years of age; however, this balance is projected to shift by 2026 with more people over the age of 65 compared to under 15 years of age (PHSA, 2019). There are currently 950 people or five percent of the population who identify as Aboriginal living within the Squamish District municipality, and 14.7% of people who consider themselves a visible minority (Government of Canada, 2018; PHSA, 2019). Squamish is located 64 km from the nearest larger community of Vancouver.

The community of Squamish is part of the Sea to Sky corridor which includes the rural towns of Squamish, Whistler, and Pemberton. The Sea to Sky corridor sits within the Coastal Community of Care, one of three geographic health service regions, serviced by Vancouver Coastal Health (Vancouver Coastal Health, 2019). Overall, Squamish has higher household income rates, higher rates of post-secondary education, and lower rates of unemployment when compared to BC (PHSA, 2019). Even though these socioeconomic indicators correlate with higher levels of general wellbeing, diabetes incidence rates are rising in North Shore/Coast Garibaldi region (BC Centre for Disease Control, 2020; PHSA, 2019). This demonstrates the complex nature of the disease and the importance of understanding the community's unique context as they may differ significantly between other community profiles.

The community health unit in Squamish is comprised of a Home Health program that includes home care nursing, home support services, rehab services, a dietitian, and a social worker. Prior to 2018, the Home Health program had a nurse dedicated to chronic disease and diabetes management who worked in collaboration with the community dietitian. However, when the nurse clinician left the position, the position was not filled. Funding dedicated to the role of chronic disease support was redirected by management and the director for Sea to Sky to

increase staff hours for community health nursing to meet the more acute demands of the community such as wound care, palliative care and home IV therapy, and for these services to be delivered in a community setting to alleviate the need for individuals to attend acute care services. As a result of service reallocation, referral for chronic disease management for type 2 diabetes to the Home Health program, has become a sole responsibility of the community dietician. Referrals to the chronic disease program come primarily from primary care providers in the community. Despite population growth of 3.9% per year since 2011(BC Stats, 2019; Statistics Canada, 2017), diabetes care services have been reduced due to the loss of the nurse clinician. The need for improved diabetes services will continue to grow as the population in Squamish is projected to shift to a larger proportion of older residents (PHSA, 2019).

Methods

The Chronic Care Model provides a framework for the findings of the gap analysis. The gap analysis includes local data to provide baseline information regarding the current referrals for diabetes services to the Squamish Home Health program, and an environmental scan. Data for the environmental scan were collected through practice experience in the role of CRN for the Home Health team including formal and informal communication with team members, and an internet search for community resources, guidelines, policies and service plans. The findings of the environmental scan are organized under the six components of the Chronic Care Model.

Formal community member and key stakeholder involvement will occur in the next phase of the project as outlined in the recommendations in chapter 6.

Local Data Collection

The clinical information system used at the Squamish Community Health Unit is the Primary Access Regional Information System (PARIS). PARIS is an electronic health records

system Vancouver Coastal Health uses for community-based programs. It is accessed by staff involved in the delivery of a wide range of health services outside of acute care hospitals including community health nursing, rehab services, dietitian services and communicable disease control (BC Freedom of Information and Privacy Association, 2011). The personal information contained includes diagnoses as well as the case notes by providers about the treatment they provide to their clients. Clients are assigned a unique personal identifier in the system for data retrieval and storage (BC Freedom of Information and Privacy Association, 2011).

Referrals for diabetes services to the community health unit come from primary care providers in the community. Referrals are entered into PARIS under the referral category 'Chronic Disease Management'. Metrics for 'Chronic Disease Management' referrals are collected and available through the Decision Support Data Analytics Solution for Health (DASH) website accessible through the secure VCH network (Vancouver Coastal Health, 2021). This information is not specific to diabetes management but provides metrics for the entire chronic disease management program. There is no referral code specific to diabetes referrals preventing metrics to be collected regarding diabetes care and management from the DASH website. To overcome the aforementioned challenges a manual search was required to identify the number of 'Chronic Disease Management' referrals specific to type 2 diabetes. A manual paper audit was proposed to the management team, approved and subsequently completed by the author. No personal identifiers were included in the data collection to maintain anonymity and confidentiality.

Environmental Scan

The environmental scan was completed by conducting an internet based search using Google and Safari search engines and the terms: 'diabetes' AND 'Squamish'. The search was

conducted between August 2020 and November 2020 to identify relevant community-based resources and services (see Appendix B for results). The primary search yielded a small number of results; therefore, the search was expanded to include community services identified in the neighbouring communities of North and West Vancouver, and Whistler. These communities are part of the Coastal Community of Care in VCH and lie between 50 and 60 km to Squamish (Vancouver Coastal Health, 2019). Due to the limited results, the search was expanded a second time and a broad search for 'diabetes' AND 'Vancouver' OR 'support' OR 'self-management' was completed to identify resources available virtually or by phone. Diabetes services available in communities beyond the Coastal Community of Care, but within VCH such as Vancouver proper were included if the services were available virtually or via the phone; however, in-person services were excluded due to the distance required for participants to travel to access services (greater than 60 km). The requirement to travel longer distances for specialized care has been associated with poorer glycemic control (Strauss et al., 2006; Zgibor et al., 2011). Virtual and telephonic services available through Diabetes Canada and the government of BC were also included. Online resources available outside Canada or through private organizations were exclude because confirming the validity of the content was beyond the scope of this project. Resources specific to type 1 diabetes or gestational diabetes were excluded from the results. The community resources identified were organized in a table according to the name of the program, goal of the program, a description including the type of providers involved, information regarding the duration or frequency of the program, referral criteria and the funding organization (see appendix B).

An additional internet-based search was completed to identify guidelines and policy documents informing diabetes care including: the service plans for VCH and the BC Ministry of

Health, diabetes guidelines for BC and Canada, and policy documents for home and community care. Clinical experience as well as formal and information communication occurring during the role as CRN allowed for an understanding of the current context of diabetes care in Squamish such as the EMR used and the current practices of the community dietitian. The results are identified in the findings below.

Findings

The findings for the gap analysis include local data and an environmental scan. The environmental scan findings are organized under the six components of the Chronic Care Model: self-management, delivery system design, decision support, clinical information systems, community resources and health system organization (Wagner et al., 2001). This provides the framework for understanding best practice as identified in the narrative literature review in relation to the current context in Squamish.

Local Data

Data available through the DASH website are organized by fiscal accounting periods; therefore the total number of referrals for 'Chronic Disease Management' was collected from April 1 2020 to January 7, 2021 (Vancouver Coastal Health, 2021). This specified period of time includes the first ten accounting periods for the 2020/2021 fiscal year. The total number of referrals for 'Chronic Disease Management' from April 1, 2020 to January 7, 2021 is 177. During this period of time, the median number of days between the referral date and the date of first contact with a provider from the Home Health program as documented in PARIS was 28 days. This data is not specific to type 2 diabetes management; therefore, a manual audit for all chronic disease management referrals from August 1 to October 31, 2020 revealed that from a total of 63 'Chronic Disease Management' referrals, 84% (n=53) were specific to all types of

diabetes. The diabetes referrals were then categorized into pre-diabetes, type 1 diabetes, type 2 diabetes and gestational diabetes for each month (see table 2). An average of 13 new referrals are received each month to the Home Health program specific to type 2 diabetes management.

Table 2

Number of Diabetes Referrals to the Home Health Program in 2020 by Month

Type of Diabetes Referral	August	September	October	Average per Month
Gestational Diabetes	4	2	2	3
Pre-Diabetes	0	2	1	1
Type 1 Diabetes	1	2	0	1
Type 2 Diabetes	11	13	15	13
Total Diabetes Referrals	16	19	18	18

This data provides a snapshot of the number and type of referrals, and the timeline for when the clients first receive care in Squamish. Alone, the data suggests the volume of people who require care and the likelihood of them receiving care in a specified timeframe. It provides a basis for future comparison and benchmarking.

Chronic Care Model

Self-Management

The Home Health program provides self-management support and education for individuals with type 2 diabetes via one-to-one in person or telephonic appointments with the dietitian. A referral from a primary care provider is required. Paper based referrals are faxed to the Home Health program requesting diabetes support. The dietitian receives a paper chart, and a referral is opened in the PARIS clinical information system to allow the dietitian to document the client encounter in a casenote which is a free text document. One-to-one self-management support and education are key components of the care the dietitian provides and includes

elements of person-centered care (SC, personal communication, October 29, 2020). For instance, plans of care are tailored to the individual based on the collaborative goals identified by the client and the dietitian. The dietitian identified her strengths in self-management support and education reside in the field of nutrition management and a bias towards nutrition counselling reflects a large part of the care she provides to her clients (SC, personal communication, October 29, 2020). Another example of person-centered self-management includes culturally sensitive food choices offered during sessions in nutrition planning (SC, personal communication, October 29, 2020). There currently are no group education or ongoing support provided by the Home Health program. The dietitian states there is no standardized follow up with clients due to her current caseload; clients are followed up on an individualized basis based on need identified by the dietitian (SC, personal communication, October 29, 2020). The self-management education and support provided by primary care providers will be explored in the future stakeholder meeting to identify what is currently being delivered by primary care providers and what are the gaps in self-management education and support.

Delivery System Design

Both the BC Ministry of Health (2020) and the VCH (2019) Service Plans prioritize team-based primary care in their first objectives. The addition of team-based multidisciplinary care aims at improving services tailored to the individual's needs (person-centered care) along with an emphasis on providing culturally competent care (BC Ministry of Health, 2020). Currently, primary care providers must submit a referral to the Home Health program for diabetes support to access the dietitian. There are no other disciplines routinely involved in diabetes support at a local level. Access to other members of the Home Health program including

rehab services and social work is not routine. With the loss of the chronic disease nurse clinician, there are no longer diabetes case management services provided.

Decision Support

In BC, we have two sets of diabetes clinical practice guidelines available to guide care: Diabetes Canada 2018 Clinical Practice Guidelines, and Diabetes Care 2015 BC Guidelines (BC Ministry of Health, 2015a; Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). The Diabetes Canada guidelines are extremely comprehensive and are intended to improve health care outcomes for Canadians with diabetes as well as address clinical care gaps between evidence-based knowledge and day-to-day clinical practice. The guidelines summarize research and provide algorithms, flowsheets, charts, checklists and other tools for decision making (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). Guidelines and recommendation are organized in chapters for topics such as physical activity, nutrition, pharmacological glycemic management, hyperglycemia, mental health, macrovascular and microvascular complication, and complementary or alternative therapies (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). The BC Guidelines describe the care objectives for the prevention, diagnosis and management of diabetes in an adult population. The BC Guidelines are focused, brief and include algorithms and flowsheets to support decision making.

Currently, the dietitian refers to both sets of guidelines in practice; however, she does not use flowsheets for documentation and there are no decision support tools or guidelines integrated into the PARIS EMR. Both the Diabetes Canada Clinical Practice Guidelines and the BC Guidelines have Diabetes Patient Care Flow Sheets available for clinicians to use as a decision support tool (BC Ministry of Health, 2015b; Canadian Diabetes Association, 2018). The

Diabetes Canada flowsheet is more comprehensive with targets noted for each section including glycemic control, health behavior intervention, cardiovascular risk assessment and management, mental health, neuropathy and retinopathy (Canadian Diabetes Association, 2018). Whereas the BC Guideline flowsheet is more concise and includes targets for some measures, but not all (BC Ministry of Health, 2015b). The flowsheets are intended for primary care providers; however, the tool is a useful guide for nurse or dietitian case managers supporting clients with diabetes to coordinate care, support decision making, create plans of care and prevent duplication of interventions (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018).

Clinical Information System

The clinical information system used by the Home Health dietitian is the EMR system PARIS. It is used to document client interactions, interventions and plans of care. The primary care providers in the community use a different EMR system other than PARIS for client care. There are no shared documentation systems; therefore, referrals and case notes are currently faxed between providers and added to the client's Home Health paper chart. There are no shared paper-based documentation tools such as flowsheets or algorithms used collaboratively between providers. Other barriers to using clinical information systems effectively include limitations in the current system, PARIS. The metrics specific to diabetes are limited within PARIS because client care is not categorized under diabetes support or management. Referrals for diabetes support are collected under the larger umbrella category of 'chronic disease management' in PARIS and are not coded specific to diabetes management. The data available pertains to all chronic disease referrals which include care provided by any provider within the Home Health team such as rehab staff as well as participants referred to the Healthy Heart program. Therefore, PARIS does not include the functionality to compile patient registries specific to clients with

diabetes cared for by the dietitian. A manual audit was required to identify the number of referrals specific to diabetes care for a specified length of time.

Community

The environmental scan identified there were no additional diabetes specific resources in Squamish other than primary care providers and the Squamish Home Health dietitian. The broader internet based search revealed diabetes services at the Diabetes Education Centre in West Vancouver approximately 55 km from Squamish providing diabetes group education (Vancouver Coastal Health, 2020b). Since the onset of the COVID 19 pandemic, the group education is currently being delivered virtually via zoom (EM, personal communication, October 29, 2020). The Diabetes Education Centre also provides services such as case management from a diabetes nurse specialist, a dietitian, a foot care nurse, an occupational therapist, and/or physician; however, these services are only available to individuals living in North and West Vancouver (EM, personal communication, October 29, 2020). Gathering information for the environmental scan allowed for the development of a relationship with the registered dietitian on the team in West Vancouver to support future planning for clients in Squamish to be referred to the group education (EM, personal communication, October 29, 2020). The group education is focused on self-management education and support as well as nutrition counselling (EM, personal communication, October 29, 2020). The programs occurs in three hour sessions, once a month for three months (Vancouver Coastal Health, 2020b). The Healthy Living Program available through VCH is similar to the Diabetes Education Centre in West Vancouver, but it is limited to Vancouver residents (Vancouver Coastal Health, 2020c).

The broader search for services available in Vancouver identified case management services available to anyone in BC through BC Diabetes and the Diabetes Clinic at Vancouver

General Hospital (BCDiabetes, 2020; Vancouver Coastal Health, 2020a). BC Diabetes is a tertiary team-based care facility in Vancouver dedicated to the management of diabetes (BCDiabetes, 2020). Referrals must be completed by a physician and the program is covered by MSP. The services include clinical care by case management, diabetes specialist, counseling, and pharmacy services. They offer virtual care for clients who live outside Vancouver; however, the service does not include group education or support (BCDiabetes, 2020). The Diabetes Clinic at the Gordon and Leslie Diamond Centre in Vancouver also offers tertiary care support to individuals with diabetes; however, they are focused on individuals with complex diabetes management issues with specific inclusion criteria as part of the referral process. The service consists of a multidisciplinary team with case management services and is covered by MSP.

Other options for self-management education and support specific to diabetes include Self-Management BC, and the Canadian Diabetes Prevention Program (BC Self-Management, 2020, p.; LMC Healthcare, 2020). Self-Management BC includes a variety of free self-management programs offered through the Province of BC and UVic including virtual and telephonic support specific to diabetes. A diabetes specific workshop includes a resource book mailed to the individual and six weekly sessions offered virtually or over the phone with a program leader. Another option available through Self-Management BC includes a coaching program where participants connect with a coach by phone once a week for three months to support participants in choosing goals as well as initiating and maintaining change.

The Canadian Diabetes Prevention Program consists of a 12 month digital coaching program via the phone to support individuals with diabetes or prediabetes make lifestyle changes (LMC Healthcare, 2020). The online resource states the program is limited to certain cities in BC; however, after email contact with the organizer, the geographic limitations of the program

are because the program is part of a research study requiring participants to access LifeLabs in order to gather baseline labwork (B. Lang, personal communication, October 27, 2020). Participants outside the cities noted on the website are able to participate if they are able to access or travel to LifeLabs for their bloodwork to be completed at the beginning and end of the program (B. Lang, personal communication, October 27, 2020).

The Sea to Sky Healthy Heart program is not specific to diabetes support; it is a rehabilitation program for people with cardiovascular disease that also addresses additional risk factors such as diabetes, COPD, and asthma (Vancouver Coastal Health, 2012). It was included in the environmental scan findings because it is a program offered within Squamish that includes self-management strategies applicable to chronic diseases such as diabetes including physical activity and nutrition education (Vancouver Coastal Health, 2012). This program is run through the Home Health program in Squamish and even though the program is not focused on diabetes management, future planning to better support diabetes care in community may involve the reorganization of the Healthy Heart program to address risk factors and behavior modification for chronic diseases with shared risk factors such as diabetes requiring similar lifestyle changes.

Health System Organization

Service plans are an important element guiding health system organization as they help direct health care design and set strategic priorities. Both the BC Ministry of Health and VCH Service Plans identify integrated team-based primary care, culturally sensitive care, and improved chronic disease supports in the community as key priorities (BC Ministry of Health, 2020; Vancouver Coastal Health, 2019). The VCH Service Plan for 2019/20-2020/21 identifies the need to support health care providers to manage individuals with chronic disease in the community to reduce complications requiring additional medical care such as emergency

department visits, hospitalizations and diagnostics tests (Vancouver Coastal Health, 2019). Primary care networks are noted as a key strategy to meet this objective (Vancouver Coastal Health, 2019). The work to implement PCNs has been occurring across the province of BC; however, Squamish is not included in the communities where the model is currently being implemented, reviewed for approval, nor has the community provided an expression of interest (Colleen Moberg, personal communication, September 16, 2020; GPSC, 2020). The service plan does not include other specific strategies directing improvements to diabetes management or chronic disease care in the community, nor does the Home and Community Care policy manual address services specific for chronic disease or diabetes management (BC Ministry of Health, 2021). This local policy gap leaves communities to organize services for chronic disease independently. Other important policies to support diabetes management include national or provincial strategies; however, neither Canada nor the province of BC have a formalized diabetes strategy (Diabetes Canada, 2019).

The Vancouver Coastal Health (2019) Service Plan 2019/20-220/21 also addresses the need to improve patient experience in their key priorities by systematically embedding cultural safety as part of quality health services. Some of the strategies provided by VCH to better support culturally competent care include the Indigenous Cultural Competency PHSA Aboriginal Health education training, an online eight week facilitator led course; a VCH Aboriginal Cultural Competency Policy; and an Aboriginal cultural practices guide for physicians and allied health care professionals (Vancouver Coastal Health, 2015). These resources support providers towards integrating culturally sensitive care in their practice; however, there are currently no culturally sensitive diabetes group classes offered in Squamish.

Discussion

The Chronic Care Model can be used to direct quality improvement initiatives as the six elements of the model provide an excellent guide to target change (Barr et al., 2003). The findings from the narrative literature review were organized under the six elements of the Chronic Care Model and provide a benchmark for the gap analysis in order to identify gaps in service and areas for improvement. This discussion explores the results of the gap analysis in light of the findings from the literature review. Person-centered care is the key theoretical perspective guiding improvements. The WHO (2016a) identifies the need for a fundamental shift towards person-centered integrated care. This means empowering people to be active participants in their own health, putting the comprehensive needs of individuals and communities at the centre of their health systems, and integrating fragmented health systems to improve continuity and comprehensiveness of care (World Health Organization, 2016a).

Effective person-centered self-management is consistently identified in the literature as a key element in diabetes management (Barr et al., 2003; Grover & Joshi, 2015; Olesen et al., 2020; Penn et al., 2015; Reynolds et al., 2018; Sherifali et al., 2018). Literature supports the adoption of both group and individual self-management for improved outcomes (Sherifali et al., 2018). Effective self-management education and support is facilitated by a provider with specialized diabetes training such as the dietitian in Squamish. For improved outcomes, the provider must be skilled at delivering person-centered care by collaborating with the individual to establish mutually agreed upon goals and actively engage the client in creating an individualized plan based on evidence-based guidelines. Diabetes Canada (2018) created a worksheet, Managing My Diabetes: My Action Plan, to support individuals and their providers at identifying goals and creating a plan for success. This tool is not currently used by Home Health;

however, it is an example of a tool to support collaborative planning between the care provider and the client that can be integrated into self-management care. Empowering the client to guide their own care is key to sustained change and improved patient satisfaction (Sherifali et al., 2018). Person-centered one-to-one care is being provided by the Home Health dietitian by co-creating individualized plans of care; however, group support is currently not provided.

Self-management education and support can be challenging to deliver in our current health care context. Sherifali et al. (2018) acknowledge challenges such as expanding caseloads, the complexity of individualized diabetes care and limited time and resources as barriers to delivering effective diabetes self-management. These obstacles reflect the difficulties of the Home Health program in Squamish to provide group education and ongoing supportive follow-up. These services have not been possible with the current caseload of the dietitian who receives an average of 18 new referrals per month for clients with diabetes in addition to other work priorities and referrals for other programs in a half-time position. If additional resources or time cannot be dedicated to diabetes management, creative solutions must be explored to address gaps in service such as partnering with other diabetes clinics including the Diabetes Education Centre in West Vancouver for group education or drawing on community resources such as Self-Management BC for group teleconference sessions or individualized coaching (BC Self-Management, 2020; Vancouver Coastal Health, 2020b).

The environmental scan identified group education classes were being delivered through the Diabetes Education Centre in West Vancouver; therefore, creating a partnership with the team in West Vancouver has opened up the opportunity for individuals in Squamish to access the group education in addition to the current one-to-one support provided by the dietitian (Vancouver Coastal Health, 2020b). As part of the partnership, the dietitian will be able to refer

clients to the classes (E. Mackay, personal communication, October 29, 2020). The coaching services and group workshops offered through Self-Management BC is another great opportunity for clients to engage in person-centered self-management (BC Self-Management, 2020). The coaching and groups are organized to meet the unique needs and goals of individuals with diabetes with the support of a trained facilitator (Project Support, personal communication, November 11, 2020). Olesen et al. (2020) identified group interaction and personal sharing from peer support were important factors in self-management; therefore, for self-management support to be successful, the responsibility needs to move beyond the care provider or program and include strategies to support the individual with diabetes with self-management throughout the duration of their lives. This may include fostering the client's own support networks and linking them with community resources for sustained support. These community resources provide options to support the gaps in service related to self-management in Squamish.

Although referring clients to services outside Squamish is one solution to bridging current gaps in service, it may not be suitable for all clients. The increasing number of Canadians living with multiple chronic disease increases their treatment burden and reduces the likelihood of their ability to comply with the complexity of uncoordinated responses to each of their problems (Boehmer et al., 2018). Referring clients to additional services increases the number of health care encounters and providers involved in their care. If these providers are not part of an integrated team, there is an increased requirement to coordinate and communicate amongst multiple clinicians with increased potential for duplication of tests and interventions increasing the overall treatment burden for the client (Boehmer et al., 2018). This treatment burden is an important factor in nonadherence to care (Boehmer et al., 2018). Clients with multiple comorbidities may be overwhelmed by additional referrals outside their current circle of care,

reducing the likelihood of participating in potentially beneficial services. Shifting to a person-centered paradigm supports the reality of people living with multiple chronic diseases. A single-disease centric approach results in coexisting conditions becoming of less importance (Canadian Academy of Health Sciences, 2017). A patient-centered approach accommodates concurrent conditions and promotes a comprehensive, coordinated approach to care. Integrating self-management education and support for multiple chronic conditions is a strategy that values a the individual. The Healthy Heart program in Squamish is an example of a program that includes self-management education and support for cardiovascular disease with the potential to integrate the lifestyle and behavior change classes with diabetes care and management as many of the lifestyle modification for risk factors are shared between chronic conditions.

Culturally sensitive care is essential to person-centered self-management. Squamish is a diverse community with 14.7% of people who consider themselves a visible minority and five percent of the population who identify as Aboriginal (PHSA, 2019). VCH has begun to purposefully integrate culturally sensitive care by providing education for staff, but it needs to become a reality at the local level by integrating it into service delivery and planning; it is currently up to the provider to integrate culturally sensitive diabetes care into practice in Squamish. The one-to-one support provided by the dietitian incorporates culturally sensitive choices such as nutrition options; however, options for culturally sensitive peer support where individuals are able connect with one another is missing from the health authority services available. Identifying private community resources was beyond the scope of the environmental scan; however, it is an area where partnerships could be actively identified and cultivated to create this type of support in the community especially since peer support has been identified as an important aspect for successful ongoing self-management.

Providing services in a variety of languages is another strategy to better support person-centered and culturally sensitive care. The Diabetes Education Centre offers diabetes education classes in both English and Farsi to better serve their client population (Vancouver Coastal Health, 2020b). During the COVID 19 pandemic from spring 2020 to present (winter 2021), the Squamish health unit was provided tablet devises with access to an app for real-time interpreter services in over 20 languages via video conferencing allowing clients to see the interpreter's face during the interpretation session. They have been used successfully for interpreting between the client and the clinician for wound care and palliative support; however, this resource may be beneficial for other programs in Home Health such as diabetes care and management. For a small community, where creating services in multiple languages may not be a reality, this is an option to better support minority groups.

The Canadian Academy of Health Sciences (2017) report outlined critical elements of person-centered primary care including the importance of a multidisciplinary teams to provide appropriate chronic disease services and to support self-management. Despite the evidence supporting the integration of team-based care for optimal diabetes management, it is not yet the norm (General Practice Service Committee, 2020; Gucciardi et al., 2015). The Home Health program in Squamish includes various disciplines; however, their current workloads and priorities do not involve diabetes management. With limited resources and time, work priorities are decided by provincial, health authority and/or local policy. Chronic disease management is included in the key priorities for the province and VCH, yet there are no guidelines to direct the implementation of team-based care across BC except for PCNs which are not currently being universally adopted (BC Ministry of Health, 2020; General Practice Service Committee, 2020; Vancouver Coastal Health, 2019). BC is working to increase people's access to multidisciplinary

teams through PCNs in the community; however, Squamish is not yet included as one of those communities; therefore, alternatives to PCNs should be explored.

BC Diabetes, a tertiary care facility based in Vancouver, provides a team-based approach to diabetes management and includes case management services (BCDiabetes, 2020). Its services are available for individuals throughout the province; however, it does not provide group education or peer support which are identified as key components of ongoing diabetes management in the literature. The Diabetes Clinic at VGH includes a team-based approach to care and education; however, their services are only available to clients with complex disease management requirements (Vancouver Coastal Health, 2020a). Future work will include identifying if clients are being referred to these services by their primary care providers and evaluating their effectiveness in bridging gaps in service.

In the absence of team-based care, there is an increased need for decision support by integrating evidence-based guidelines into routine care. Ricci-Cabello et al. (2013) report rural areas often lack access to a multidisciplinary team which increases the burden on the primary care provider to be responsible for all aspects of care including self-management education within the time constraints of a traditional medical system. Braga et al. (2010) found significant gaps in the treatment Canadians were receiving for type 2 diabetes even after the publication of the Canadian Diabetes Clinical Practice Guidelines. Patients were not achieving guideline recommended targets, nor receiving appropriate therapy (Braga et al., 2010). This gap between the treatment outlined in the guidelines and the care received by Canadians with diabetes encourages the need for a redesign of services to better meet the health care needs of individuals living with diabetes. Part of the redesign to improve guideline adherence is integrating decision support into practice (Clement et al., 2018). The PARIS clinical information system used by the

Home Health program does not include integrated guidelines; therefore, the responsibility for integrating best practice information from the Diabetes Canada Clinical Practice Guidelines and the BC Guidelines is up to the individual provider such as the dietitian (BC Ministry of Health, 2015a; Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018). Embedding guidelines and decision support tools into the EMR system or using paper-based flowsheets and algorithms improves outcomes and supports providers to deliver consistent, evidence-based care (Clement et al., 2018; Stellefson et al., 2013). This assumes the guidelines are worth following. Greenhalgh (2019) suggests criteria for guidelines that justify the push to applying them to practice. These criteria include content that is based on a comprehensive and rigorous review of the evidence, and the presentation and organization of the guideline that makes it easy to follow (Greenhalgh, 2019). Both guidelines mentioned above include levels of evidence associated with each recommendation and the inclusion of flowsheets and algorithms make them easier to follow. The Diabetes Canada guidelines are significantly longer and more detailed including a thorough systematic review of the evidence; the entire guideline is over 300 pages long making it necessary to rely on the decision support tools to guide practice unless the provider has dedicated time to becoming well versed in the entire contents (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018).

The current clinical information system used by providers of the Home Health program in Squamish has significant limitations preventing the team from benefiting from the positive advantages of using EMR systems for diabetes care. The PARIS system lacks the ability to compile patient registries specific to diabetes management and is unable to track diabetes trends. This limits the ability for benchmarking and for evaluating quality improvement projects without having to complete manual audits. The system does not allow for follow up visits to be

automatically flagged and subsequently booked. Collaboration between primary care providers and the dietitian is reliant upon faxing information creating the need for paper charts in addition to documenting in the EMR. This duplication of information increases the chances for error, creates the potential for lost information and contributes to fragmented health services. These challenges to collaborative care translate to barriers in providing person-centered care; care is no longer organized around the individual, but around the system.

Diabetes outcomes improve when clinical information systems contribute to communication and collaboration amongst health care providers, facilitate tracking of client trends for benchmarking, and guide decision making by integrating decision support tools and guidelines. However, the current system in Squamish is not functioning at this level of potential. It is not clear based on findings of the gap analysis if these limitations are unique to how PARIS is configurated for the Coastal Community of Care or if PARIS has the potential for increased functionality. One of the future recommendations includes investigating the potential for improvements to the current system and/or advocating for a change of clinical information system.

The distance required for individuals from rural communities to travel for specialized diabetes services is associated with poorer outcomes (Ricci-Cabello et al., 2013; Strauss et al., 2006). Telemedicine is an evidence-based option to support diabetes management especially for smaller communities with limited resources. It allows access to specialized services offered in larger centers without individuals having to travel long distances. Since the onset of the COVID 19 pandemic, options for telemedicine services have increased. For instance, the diabetes group education provided at the Diabetes Education Centre in West Vancouver was previously only available in person, but now the sessions are available virtually or by phone (E. Mackay,

personal communication, October 29, 2020). Telemedicine can be used for conferencing with health care team members and consultations with specialists (BCDiabetes, 2020; Clement et al., 2018). This shift supports a person-centered approach to health care services, reducing the gap in services available to individuals living remotely. There are a wide variety of telemedicine resources available to support diabetes management such as online education through Self-Management BC, apps to track glycemic control and to support lifestyle changes, and social networking through group education (BC Self-Management, 2020; Clement et al., 2018; Hou et al., 2016). Barriers to telemedicine include the technological literacy of clients; however, most virtual platforms such as zoom also allow for telephonic service for clients who do not have access to computers or the skill to navigate the service (Mignerat et al., 2014). However, when planning telemedicine services, computer support should be included to assist populations with low technological literacy to reduce barriers to accessing care.

Despite the World Health Organization recommending every country implement a diabetes strategy, Canada has been without a formal strategy since 2013 (Diabetes Canada, 2019). Diabetes Canada created a comprehensive set of clinical practice guidelines (Diabetes Canada Clinical Practice Guidelines Expert Committee, 2018), and the BC Ministry of Health has its own set of clinical guidelines (BC Ministry of Health, 2015a), yet there is no unifying strategy on how to organize diabetes care or service delivery. The BC and VCH service plans identify priorities to improve chronic disease care in the community yet there are no strategies at a local level regarding how to enact these priorities. This policy deficit at a local level shifts the responsibility onto local health authorities and communities to address gaps in diabetes care.

CHAPTER 6

Conclusion

Type 2 diabetes is a worldwide challenge with significant health and economic impacts (International Diabetes Federation, 2019; World Health Organization, 2020). With approximately eight percent of British Columbians living with diabetes and 29,000 individuals newly diagnosed each year, type 2 diabetes is one of the top preventable diseases impacting the wellbeing of individuals and communities (BC Centre for Disease Control, 2020; Diabetes Canada, 2019; International Diabetes Federation, 2019). Improvements to diabetes care can be realized by optimizing services under the six elements of the Chronic Care Model from an integrated person-centered approach (Clement et al., 2018; Grover & Joshi, 2015). The six elements include self-management, delivery system design, decision support, clinical information systems, community resources and health system organization. Improvements can be focused on any element to optimize diabetes management in the community setting; however, the greatest gains are achievable when improvements include multiple elements of the Chronic Care Model and most notably self-management and delivery system design (Elissen et al., 2013b; Grover & Joshi, 2015; Reynolds et al., 2018).

This project compared best practices for diabetes care and services with the findings from the local environmental scan to identify gaps in service for diabetes management in the community of Squamish, BC. The gap analysis identified these areas for improvement: creating group self-management education and ongoing support through follow-up, building multidisciplinary team-based care, adding case management services, integrating decision support tools into practice, advocating for clinical information systems with patient registries for tracking trends and collaborative documentation, connecting with community resources to fill

gaps in services and create peer support, utilizing telemedicine technology to support diabetes care, and advocating for health system policy that supports diabetes services at a local level. A balance between referring to outside services to bridge service gaps and avoiding increasing the overall treatment burden should be taken into account. With increasing numbers of individuals with type 2 diabetes living with other comorbidities, integrating services for a variety of chronic diseases has the potential to reduce this burden (Boehmer et al., 2018; Canadian Academy of Health Sciences, 2017; Pryke, 2019).

This project resulted in evidence-based recommendations unique to the context of Home Health in Squamish to optimize diabetes care and create a plan for future action. Developing a community plan to improve diabetes care is as individualized as the individual's plan for managing the disease; therefore, collaborating with community members and key stakeholders is the next step in validating and prioritizing results from this project to create the foundation for future action. This project was focused on the Home Health program in Squamish; therefore, limitations to this project include the missing perspectives of primary care providers and community members with diabetes. Whichever recommendations become the focus for quality improvement work, it is essential the concepts of person-centered, evidence-based and integrated care underpin the work as they lead to healthier people, communities and better care (World Health Organization, 2016a, 2002). By having a better understanding of how diabetes care is organized, it is possible to imagine creative solutions to the challenge of providing effective diabetes care within the constraints of competing resources and funding in rural community in BC.

These next steps are an opportunity to engage the community for participatory planning. Recommendations for future work are noted in the next section based on the findings of the literature review and gap analysis.

Recommendations

The recommendations are based on the results of the narrative literature review and gap analysis. The Chronic Care Model is a useful framework to organize the recommendations and to focus future quality improvement efforts (see table 3). A plan for future action includes hosting a focus group for individuals with type 2 diabetes and a key stakeholder meeting including primary care providers to address the limitation noted in the conclusion. The recommendations listed below will be reviewed in the focus group and stakeholder meetings to validate results, to add new recommendations based on clients' and providers' perspectives and to prioritize future work based on the agreed upon recommendations. These recommendations may not all be attainable with a finite number of resources; however, it provides a list of suggestions to prioritize based on the outcomes of the focus group and stakeholder meeting. All interventions and changes to the current Home Health program for diabetes management must include a plan for evaluation.

Table 3

Recommendations and Evidence

Recommendations	Evidence
Self-Management • Add group self-management education and support either by creating group classes in Squamish or, referring clients to group classes at the Diabetes Education Center in West Vancouver • Create a systematic process for scheduling ongoing follow up • Integrating chronic disease services to reduce treatment burden for clients with multimorbidity	Improved outcomes associated with self- management education and support when delivered by a combination of individual and group diabetes management with greater than 10 hours of contact time (Chrvala et al., 2016) and follow-up at least 4 times a year (Sherifali et al., 2018). Multimorbidity increases the treatment burden (Boehmer et al., 2018; Pryke, 2019).

Delivery System Design • Integrating additional disciplines from Home Health into diabetes care and management to create team-based care until PCNs are developed in the community • Adding case management care by allocating additional time for the dietitian to case manage clients or adding a nurse case manager	Multidisciplinary team-based care result in improved outcomes for diabetes care (Barrett et al., 2007; Clement et al., 2018; Siminerio et al., 2005; Wagner et al., 2001). Case management results in improved glycemic control and cardiovascular risk factors (Clement et al., 2018; Wagner et al., 2001).
Decision Support • Integrate diabetes guidelines into routine practice by using flowsheets and decision support tools from Diabetes Canada or BC Guidelines until the clinical information system allows for guidelines to be embedded in the EMR • Integrating telemedicine to support care with specialized services and self-management resources such as Self-Management BC	Integrating decision support tools into practice result in better adherence to clinical practice guidelines, improved glycemic control and cholesterol markers (Baptista et al., 2016; Stellefson et al., 2013). Telemedicine strategies improve glycemic control and cardiovascular risk factors (Clement et al., 2018; Riazi et al., 2015).
Clinical Information Systems • Investigating the potential for improvements to the current clinical information system and/or advocating for a change of clinical information system to allow for patient registries, diabetes trend tacking, benchmarking and evaluating quality improvement work	Clinical information system technologies are associated with reduced HbA1C levels (Riazi et al., 2015).
Community Resources • Create partnerships with community resources to bridge gaps in service • Create partnerships with local community groups and to create culturally sensitive peer supports such as with the Squamish Nation and community religious groups. • Groups interested in creating diabetes or chronic disease supports should be involved in future planning.	Creating community partnerships addresses barriers to care and creates opportunities to address gaps in service (Clement et al., 2018; Ricci-Cabello et al., 2013; Stellefson et al., 2013)
Health System Organization • Advocate for health system policy that supports diabetes services at a local level.	For health services to succeed in reorganizing or optimizing diabetes care and services, it must be included in organizational goals or policy (World Health Organization, 2016a).

Evaluation is necessary to assess the quality and effectiveness of the recommendations and interventions (McKenzie et al., 2013). Evaluations include formative evaluations that occur during the process of planning and implementation to assess the overall quality or elements of the process, and summative evaluation which occurs at the end to assess the effectiveness of the interventions (McKenzie et al., 2013). Formative or process evaluations include validating the results of the narrative review and gap analysis with community members and key stakeholders. Other example of formative evaluation includes evaluation strategies to assess whether quality improvement interventions are having the desired effect. These would be specific to the interventions. For example, if the intervention is to create group self-management sessions, formative evaluation could include a client satisfaction survey to assess if the sessions addressed self-management topics; whereas summative evaluation would assess if behavior change occurred or improvement in glycemic control or reduction of cardiovascular events occurred. Summative evaluation can be more challenging to complete as it often requires more time and resources (McKenzie et al., 2013).

Evaluation methods will be included in the planning of the quality improvement initiatives as it is important to determine achievement of the intended goals, to provide accountability for actions and interventions to the community and key stakeholders, and to increase support for future improvements (McKenzie et al., 2013). Additional evaluation tools specific to evaluating the effectiveness of person-centered implementation strategies in accordance with the Chronic Care Model include the Patient Assessment of Care for Chronic Conditions (PACIC) (Improving Chronic Illness Care, 2021). The PACIC is an assessment tool used to measure actions and qualities of care for chronic diseases as experienced by patients

(Improving Chronic Illness Care, 2021). This Patient-Reported Experience Measure (PREMs) is an evaluation tool that can be used to assess and benchmark quality improvement projects as it assesses a person-centered approach to care and can be applied regardless of the objective of the specific intervention. Patient-Reported Outcome Measures (PROMs) is another person-centered tool to measure the impact on outcomes and can be tailored to the intervention (Santana et al., 2018). The outcome measure would be selected based on what goals are being assessed as part of the quality improvement work.

Focus Group

Recommendations include hosting a focus group for individuals in the community living with type 2 diabetes. This person-centered care approach incorporates the clients' perspective regarding the services they currently access and creates an opportunity to identify gaps in care. Focus groups are a useful participatory qualitative method to obtain preliminary insights or confirm information on a particular issue from a specific group of people (McKenzie et al., 2013). A quality leader from the Quality, Patient Safety and Infection Control team would be involved in the planning of the session to ensure it conforms to ethical standards. An invitation to five to eight individuals currently receiving care from the Home Health program would be sent three weeks prior to the session. The session would be held over two hours at the health unit or virtually due to restrictions from the COVID 19 pandemic and include a set of semi-structured interview questions to guide the conversation (see appendix C). Answers will be recorded on flip chart to allow for a summary of the responses to be validated prior to closing the session. The focus group is essential to the integrity of the process in order to identify gaps in service not yet identified in the project and validate the recommendations. A limitation to the process includes the findings of the focus group may not be generalizable to the population of individuals with

type 2 diabetes in Squamish because the focus group will only include the perspective of a limited number of participants (McKenzie et al., 2013).

Stakeholder Meeting

The key stakeholder meeting is fundamental to the process of optimizing diabetes care because primary care providers are central to the care for individuals with type 2 diabetes and their voice has not yet been added this project. At present, despite a voiced interest in improving current diabetes services by the manager of Home Health and the primary care physicians in the community, the response to the COVID 19 pandemic has taken priority over other initiatives such as chronic disease management (C. Moberg, personal communication, November 12, 2020).

It is essential for future work that key stakeholders from the community validate results and recommendations and are involved in future planning. Participants of the key stakeholder meeting include members of the Home Health program: the manager, the team lead, the intake nurse, the dietitian, a member from the rehab team, a social worker, the community pharmacist, and primary care provider representatives from each of the three family physician practices in Squamish. For community priorities to be successful, key stakeholders must be the ones to establish priorities and set goals (McKenzie et al., 2013).

The purpose of the stakeholder meeting includes three main objectives: 1) disseminate a summary of the findings of the literature review and gap analysis, 2) identify current services offered to people living in the community with type 2 diabetes and identify what services the key stakeholders felt are missing, and 3) review and revise recommendations to generate a plan for future work. An agenda outlines the elements of the session (see table 3).

Table 4

Agenda for Stakeholder Meeting

Time	Agenda Items
0900-0915	Meet and greet for participants Share role and what they are hoping to learn or accomplish in the meeting
0915-0930	Presentation of the summary of finding from the narrative literature review and gap analysis
1030-1045	Coffee break
1045-1115	Group discussion based on semi-structured questions (see Appendix C).
1115-1145	Group discussion to identify key priorities and make plan for future work
1145-1200	Conclude meeting with summary and plan for next steps

A set of semi-structured interview questions guide the group discussion (see appendix C). The answers will be recorded on a white board or flip chart and will be summarized in a table and shared with the participants via email within 2 weeks of the meeting. Responses will be organized under the six elements of the Chronic Care Model. Future work will include a plan to evaluate any recommendations implemented as described in the Recommendations section. A timeline for the work required to prepare for the stakeholder meeting is included in appendix D and a sample email invitation to send to participants in appendix E.

CHAPTER 7

Reflection

The idea for this project was sparked by a perceived gap in services for people living with type 2 diabetes in Squamish. I started by wondering what diabetes care should look like in the community setting, but I had no idea where to begin. A broad literature search was initiated to assess different ways to optimize and organize diabetes health services. Some of the major themes that emerged regardless of the theory, model or framework being used to examine type 2 diabetes management included integrated care, person-centered care, self-management, team-based or multidisciplinary care, evidence-based care, and care pathways. Organizing all the findings from a broad literature review was challenging. When I looked at the major themes I identified in the literature, many of them were the same as the elements of the Chronic Care Model which then became my framework to organize all the information.

Having a framework to evaluate the literature and to focus the gap analysis was essential in reducing my bias towards certain aspects of diabetes care such as self-management education and support as well as team-based care. Those elements of diabetes care were of greater interest to me and I was less inclined to be interested in the benefits of clinical information systems supporting the delivery of diabetes care. The Chronic Care Model provided an unbiased structure to the elements with evidence to support improved diabetes outcomes. The process evolved over the course of a year and has resulted in clear recommendation that I am extremely hopeful may become action. Integrating clients and primary care providers from the community is the next step towards prioritizing quality improvement work. Together, we build capacity to make change, and we will be able to improve care for individuals with type 2 diabetes in Squamish.

References

Alharbi, N. S., Alsubki, N., Jones, S., Khunti, K., Munro, N., & de Lusignan, S. (2016). Impact of information technology-based interventions for type 2 diabetes mellitus on glycemic control: A systematic review and meta-analysis. *Journal of Medical Internet Research*, *18*(11), e310. https://doi.org/10.2196/jmir.5778

Baptista, D. R., Wiens, A., Pontarolo, R., Regis, L., Reis, W. C. T., & Correr, C. J. (2016). The chronic care model for type 2 diabetes: A systematic review. *Diabetology & Metabolic Syndrome*, *8*(1), 7. https://doi.org/10.1186/s13098-015-0119-z

Barr, V., Robinson, S., Marin-Link, B., Underhill, L., Dotts, A., Ravensdale, D., & Salivaras, S. (2003). The expanded Chronic Care Model: An integration of concepts and strategies from population health promotion and the Chronic Care Model. *Healthcare Quarterly*, *7*(1), 73–82. https://doi.org/10.12927/hcq.2003.16763

Barrett, J., Curran, V., Glynn, L., & Godwin, M. (2007). *CHSRF synthesis: Interprofessional collaboration and quality primary healthcare*. Canadian Health Services Research Foundation. https://docplayer.net/18393911-Chsrf-synthesis-interprofessional-collaboration-and-quality-primary-healthcare.html

BC Centre for Disease Control. (2020). *Chronic disease dashboard*. http://www.bccdc.ca/health-professionals/data-reports/chronic-disease-dashboard

BC Freedom of Information and Privacy Association. (2011). *Other ministry of health databases*. Health Information Privacy in British Columbia. http://www.healthinfoprivacybc.ca/other-health-information-programs/other-ministry-of-health-databases

BC Ministry of Health. (2014). *Setting priorities for the B.C. health system*. https://www.health.gov.bc.ca/library/publications/year/2014/Setting-priorities-BC-Health-Feb14.pdf

BC Ministry of Health. (2015a). *Diabetes care: BC guidelines*. Province of British Columbia. https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diabetes

BC Ministry of Health. (2015b). *Diabetes patient care flow sheet*. https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/dc_flow_sheet.pdf

BC Ministry of Health. (2015c). *The British Columbia patient-centered care framework.* https://www.health.gov.bc.ca/library/publications/year/2015_a/pt-centred-care-framework.pdf

BC Ministry of Health. (2018). *North Shore-Coast Garibaldi*. https://www2.gov.bc.ca/assets/gov/data/geographic/land-use/administrative-boundaries/health-boundaries/33_north_shore-coast_garibaldi.pdf

BC Ministry of Health. (2020). *Ministry of Health 2020/21—2022/23 service plan*. https://www2.gov.bc.ca/assets/gov/government/ministries-organizations/ministries/health/hlth_sp_2020.pdf

BC Ministry of Health. (2021). *Home and community care policy manual*. Province of British Columbia. https://www2.gov.bc.ca/gov/content/health/accessing-health-care/home-community-care/accountability/policy-and-standards/home-and-community-care-policy-manual

BC Self-Management. (2020). *Self-Management BC*. https://www.selfmanagementbc.ca/home

BC Stats. (2019). *2019 sub-provincial population estimates highlights*. https://www2.gov.bc.ca/assets/gov/data/statistics/people-population-community/population/pop_sub-provincial_population_highlights.pdf

BCDiabetes. (2020). *BCDiabetes—British Columbia diabetes care, research, and education*. BCDiabetes. https://www.bcdiabetes.ca/

Boehmer, K. R., Abu Dabrh, A. M., Gionfriddo, M. R., Erwin, P., & Montori, V. M. (2018). Does the chronic care model meet the emerging needs of people living with multimorbidity? A systematic review and thematic synthesis. *PloS One*, *13*(2), e0190852. https://doi.org/10.1371/journal.pone.0190852

Bongaerts, B. W. C., Müssig, K., Wens, J., Lang, C., Schwarz, P., Roden, M., & Rathmann, W. (2017). Effectiveness of chronic care models for the management of type 2 diabetes mellitus in Europe: A systematic review and meta-analysis. *BMJ Open*, *7*(3), e013076. https://doi.org/10.1136/bmjopen-2016-013076

Braga, M. F., Casanova, A., Teoh, H., Dawson, K. G., Gerstein, H. C., Fitchett, D. H., Harris, S. B., Honos, G., McFarlane, P. A., Steele, A., Ur, E., Yale, J.-F., Langer, A., Goodman, S. G., & Leiter, L. A. (2010). Treatment gaps in the management of cardiovascular risk factors in patients with type 2 diabetes in Canada. *The Canadian Journal of Cardiology*, *26*(6), 297–302.

Busetto, L., Luijkx, K. G., Elissen, A. M. J., & Vrijhoef, H. J. M. (2016). Context, mechanisms and outcomes of integrated care for diabetes mellitus type 2: A systematic review. *BMC Health Services Research*, *16*(16). https://doi.org/10.1186/s12913-015-1231-3

Canadian Academy of Health Sciences. (2017). *Review of chronic care*. https://www.cahs-acss.ca/wp-content/uploads/2017/09/Review-of-Chronic-Care_Veterans-Affairs-Canada.pdf

Canadian Diabetes Association. (2018). Diabetes patient care flow sheet for adults. *Canadian Journal of Diabetes*, *42*, S309–S310. https://doi.org/10.1016/j.jcjd.2017.10.042

Chrvala, C. A., Sherr, D., & Lipman, R. D. (2016). Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Education and Counseling*, *99*(6), 926–943. https://doi.org/10.1016/j.pec.2015.11.003

Clement, M., Filteau, P., Harvey, B., Jin, S., Laubscher, T., Mukerji, G., & Sherifali, D. (2018). Organization of diabetes care. *Canadian Journal of Diabetes*, *42*, S27–S35. https://doi.org/10.1016/j.jcjd.2017.10.005

Desmedt, M., Vertriest, S., Hellings, J., Bergs, J., Dessers, E., Vankrunkelsven, P., Vrijhoef, H., Annemans, L., Verhaeghe, N., Petrovic, M., & Vandijck, D. (2016). Economic impact of integrated care models for patients with chronic diseases: A systematic review. *Value in Health*, *19*(6), 892–902. https://doi.org/10.1016/j.jval.2016.05.001

Diabetes Canada. (2018). *Managing my diabetes: My action plan*. https://www.diabetes.ca/DiabetesCanadaWebsite/media/Managing-My-Diabetes/Tools%20and%20Resources/managing-my-diabetes-my-action-plan.pdf?ext=.pdf

Diabetes Canada. (2019). *2020 pre-budget consultation submission*. https://www.diabetes.ca/DiabetesCanadaWebsite/media/Advocacy-and-

Policy/Submissions%20to%20Government/Provincial/2020-BC-Pre-Budget-Submission_Final.pdf

Diabetes Canada Clinical Practice Guidelines Expert Committee. (2018). Diabetes Canada 2018 clinical practice guidelines. *Candian Journal of Diabetes*, *42*(S1), S1–S325.

Dinca-Panaitescu, M., Dinca-Panaitescu, S., Raphael, D., Bryant, T., Pilkington, B., & Daiski, I. (2012). The dynamics of the relationship between diabetes incidence and low income: Longitudinal results from Canada's National Population Health Survey. *Maturitas*, *72*(3), 229–235. https://doi.org/10.1016/j.maturitas.2012.03.017

District of Squamish. (2015). *Community profile*. https://squamish.ca/assets/Economic-Development/40a0b58e88/Community-Profile-October-2015.pdf

Dorsey, E. R., & Topol, E. J. (2016). State of telehealth. *New England Journal of Medicine*, *375*(2), 154–161. https://doi.org/10.1056/NEJMra1601705

Doyle, A. (2020). *Best diabetes apps of 2020*. Healthline. https://www.healthline.com/health/diabetes/top-iphone-android-apps

Elissen, A. M. J., Steuten, L. M. G., Lemmens, L. C., Drewes, H. W., Lemmens, K. M. M., Meeuwissen, J. A. C., Baan, C. A., & Vrijhoef, H. J. M. (2013a). Meta-analysis of the effectiveness of chronic care management for diabetes: Investigating heterogeneity in outcomes. *Journal of Evaluation in Clinical Practice*, *19*(5), 753–762. https://doi.org/10.1111/j.1365-2753.2012.01817.x

Elissen, A. M. J., Steuten, L. M. G., Lemmens, L. C., Drewes, H. W., Lemmens, K. M. M., Meeuwissen, J. A. C., Baan, C. A., & Vrijhoef, H. J. M. (2013b). Meta-analysis of the effectiveness of chronic care management for diabetes: Investigating heterogeneity in

outcomes. *Journal of Evaluation in Clinical Practice*, *19*(5), 753–762. https://doi.org/10.1111/j.1365-2753.2012.01817.x

Epstein, R. M., & Street, R. L. (2011). The values and value of patient-centered care. *Annals of Family Medicine*, *9*(2), 100–103. https://doi.org/10.1370/afm.1239

Ferrari, R. (2015). Writing narrative style literature reviews. *Medical Writing*, *24*, 230–235. https://doi.org/10.1179/2047480615Z.000000000329

Forbes, A., While, A., Griffiths, P., Ismail, K., & Heller, S. (2011). Organizing and delivering diabetes education and self-care support: Findings of scoping project. *Journal of Health Services Research & Policy*, *16*(s1), 42–49. https://doi.org/10.1258/jhsrp.2010.010102

General Practice Service Committee. (2020). *Primary care networks*. https://gpscbc.ca/what-we-do/system-change/primary-care-networks

General Practice Service Committee. (2020). *Team-based care*. https://gpscbc.ca/what-we-do/system-change/team-based-care

Goodwin, N., Smith, J., Davies, A., Perry, C., Rosen, R., Dixon, J., & Ham, C. (2012). Integrated care for patients and populations: Improving outcomes by working together. *A Report to the Department of Health and the NHS Future Forums*.

Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade. *Journal of Chiropractic Medicine*, *5*(3), 101–117. https://doi.org/10.1016/S0899-3467(07)60142-6

Greenhalgh, T. (2019). *How to read a paper: The basics of evidence-based medicine and healthcare* (Sixth edition). John Wiley & Sons Ltd.

Grover, A., & Joshi, A. (2015). An overview of chronic disease models: A systematic literature review. *Global Journal of Health Science*, *7*(2), 210–227. https://doi.org/10.5539/gjhs.v7n2p210

Gucciardi, E., Espin, S., Morganti, A., & Dorado, L. (2015). Implementing specialized diabetes teams in primary care in southern Ontario. *Canadian Journal of Diabetes*, *39*(6), 467–477. https://doi.org/10.1016/j.jcjd.2015.07.006

Gucciardi, E., Espin, S., Morganti, A., & Dorado, L. (2016). Exploring interprofessional collaboration during the integration of diabetes teams into primary care. *BMC Family Practice*, *17*(11). https://doi.org/10.1186/s12875-016-0407-1

Hou, C., Carter, B., Hewitt, J., Francisa, T., & Mayor, S. (2016). Do mobile phone applications improve glycemic control (HbA1c) in the self-management of diabetes? A systematic review, meta-analysis, and GRADE of 14 randomized trials. *Diabetes Care*, *39*(11), 2089–2095. https://doi.org/10.2337/dc16-0346

Houlden, R. L. (2018). Introduction. *Canadian Journal of Diabetes*, *42*, S1–S5. https://doi.org/10.1016/j.jcjd.2017.10.001

Improving Chronic Illness Care. (2021). *PACIC survey: Improving Chronic Illness Care*. http://www.improvingchroniccare.org/index.php?p=PACIC_Survey&s=36

Improving Chronic Illness Care (ICIC). (2020). *The Chronic Care Model: Model elements*. http://www.improvingchroniccare.org/index.php?p=Model_Elements&s=18

International Diabetes Federation. (2009). *IDF diabetes atlas: 4th edition*.

International Diabetes Federation. (2019). *IDF diabetes atlas: 9th edition*. https://www.diabetesatlas.org/upload/resources/material/20200302_133351_IDFATLAS9e-final-web.pdf#page=38&zoom=auto

Lim, L. L., Lau, E. S. H., Kong, A. P. S., Davies, M. J., Levitt, N. S., Eliasson, B., Aguilar-Salinas, C. A., Ning, G., Seino, Y., So, W. Y., McGill, M., Ogle, G. D., Orchard, T. J., Clarke, P., Holman, R. R., Gregg, E. W., Gagliardino, J. J., & Chan, J. C. N. (2018). Aspects of multicomponent integrated care promote sustained improvement in surrogate clinical outcomes: A systematic review and meta-analysis. *Diabetes Care*, *41*(6), 1312–1320. https://doi.org/10.2337/dc17-2010

LMC Healthcare. (2020). *Diabetes prevention*. https://www.lmc.ca/diabetes-prevention/

Locke, S. R., Dix, G., Te Hiwi, B., Oelke, N. D., Rush, K. L., Berg, S., Dinwoodie, M., Jung, M. E., & Martin Ginis, K. A. (2020). Improving diabetes care in the British Columbia Southern Interior: Developing community–university initiatives to address service gaps. *Canadian Journal of Diabetes*. https://doi.org/10.1016/j.jcjd.2020.04.003

Manns, B. J., Tonelli, M., Zhang, J., Campbell, D. J. T., Sargious, P., Ayyalasomayajula, B., Clement, F., Johnson, J. A., Laupacis, A., Lewanczuk, R., McBrien, K., & Hemmelgarn, B. R. (2012). Enrolment in primary care networks: Impact on outcomes and processes of care for patients with diabetes. *Canadian Medical Association Journal*, *184*(2), E144–E152. https://doi.org/10.1503/cmaj.110755

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2013). *Planning, implementing and evaluating health promotion programs: A primer* (6th ed.). Pearson Education, Inc. https://www.vitalsource.com/en-ca/products/planning-implementing-amp-evaluating-health-james-f-mckenzie-v9780134394060

Mignerat, M., Lapointe, L., & Vedel, I. (2014). Using telecare for diabetic patients: A mixed systematic review. *Health Policy and Technology*, *3*(2), 90–112. https://doi.org/10.1016/j.hlpt.2014.01.004

Morgan, S., & Yoder, L. H. (2012). A concept analysis of person-centered care. *Journal of Holistic Nursing*, *30*(1), 6–15. https://doi.org/10.1177/0898010111412189

O'Brien, S. V., & Hardy, K. J. (2003). *Developing and implementing diabetes care pathways*. *7*(2), 4.

Olesen, K., Hempler, N. F., Drejer, S., Baumgarten, S. V., & Stenov, V. (2020). Impact of patient-centred diabetes self-management education targeting people with type 2 diabetes: An integrative review. *Diabetic Medicine*, *37*(6), 909–923. https://doi.org/10.1111/dme.14284

Penn, M. L., Kennedy, A. P., Vassilev, I. I., Chew-Graham, C. A., Protheroe, J., Rogers, A., & Monks, T. (2015). Modelling self-management pathways for people with diabetes in primary care. *BMC Family Practice*, *16*(1), 112. https://doi.org/10.1186/s12875-015-0325-7

PHSA. (2019). *BC community health profile: Squamish*. http://communityhealth.phsa.ca/HealthProfiles/PdfGenerator/Squamish

Pryke, R. (2019). The challenges of multimorbidity: Building bridges between diabetes and comorbidities. *Diabetes & Primary Care*, *21*(3), 79–83.

Public Health Agency of Canada. (2016). *Health status of canadians 2016*. https://healthycanadians.gc.ca/publications/department-ministere/state-public-health-status-2016-etat-sante-publique-statut/alt/pdf-eng.pdf

Pulvirenti, M., McMillan, J., & Lawn, S. (2014). Empowerment, patient centred care and self-management. *Health Expectations : An International Journal of Public Participation in Health Care and Health Policy*, *17*(3), 303–310. https://doi.org/10.1111/j.1369-7625.2011.00757.x

Reichert, S. M., Harris, S., & Harvey, B. (2014). An innovative model of diabetes care and delivery: The St. Joseph's Primary Care Diabetes Support Program (SJHC PCDSP). *Canadian Journal of Diabetes*, *38*(3), 212–215. https://doi.org/10.1016/j.jcjd.2014.03.008

Reynolds, R., Dennis, S., Hasan, I., Slewa, J., Chen, W., Tian, D., Bobba, S., & Zwar, N. (2018). A systematic review of chronic disease management interventions in primary care. *BMC Family Practice*, *19*(1), 11. https://doi.org/10.1186/s12875-017-0692-3

Riazi, H., Larijani, B., Langarizadeh, M., & Shahmoradi, L. (2015). Managing diabetes mellitus using information technology: A systematic review. *Journal of Diabetes and Metabolic Disorders*, *14*. https://doi.org/10.1186/s40200-015-0174-x

Ricci-Cabello, I., Ruiz-Perez, I., Rojas-García, A., Pastor, G., & Gonçalves, D. C. (2013). Improving diabetes care in rural areas: A systematic review and meta-analysis of quality improvement interventions in OECD countries. *PLoS ONE*, *8*(12), e84464. https://doi.org/10.1371/journal.pone.0084464

Romanow, R. (2002). *Building on values: The future of health care in Canada—Final Report*. National Library of Canada.

Santana, M. J., Manalili, K., Jolley, R. J., Zelinsky, S., Quan, H., & Lu, M. (2018). How to practice person-centred care: A conceptual framework. *Health Expectations : An International Journal of Public Participation in Health Care and Health Policy*, *21*(2), 429–440. https://doi.org/10.1111/hex.12640

Sherifali, D., Berard, L. D., Gucciardi, E., MacDonald, B., & MacNeill, G. (2018). Self-management education and support. *Canadian Journal of Diabetes*, *42*, S36–S41. https://doi.org/10.1016/j.jcjd.2017.10.006

Siminerio, Piatt, G., & Zgibor, J. C. (2005). Implementing the chronic care model for improvements in diabetes care and education in a rural primary care practice. *The Diabetes Educator*, *31*(2), 225–235.

Siminerio, Ruppert, K., Huber, K., & Toledo, F. G. S. (2014). Telemedicine for Reach, Education, Access, and Treatment (TREAT): Linking telemedicine with diabetes self-management education to improve care in rural communities. *The Diabetes Educator*, *40*(6), 797–805. https://doi.org/10.1177/0145721714551993

Statistics Canada. (2017). *Census Profile, 2016 Census—North Shore/Coast Garibaldi Health Service Delivery Area*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=HR&Code1=5933&Geo2=PR&Code2=59&SearchText=North%20Shore/Coast%20Garibaldi%20Health%20Service%20Delivery%20Area&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=5933&TABID=1&type=0

Statistics Canada. (2017). *Census Profile, 2016 Census—Squamish, British Columbia*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=0781&Geo2=PR&Code2=59&Data=Count&SearchText=Squamish&SearchType=Begins&SearchPR=01&B1=All

Statistics Canada. (2018). *Aboriginal population profile, 2016 Census—Squamish, district municipality*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5931006&Data=Count&SearchText=squamish&SearchType=Begins&B1=All&SEX_ID=1&AGE_ID=1&RESGEO_ID=1

Statistics Canada. (2018b). *Diabetes, 2017*. https://www150.statcan.gc.ca/n1/pub/82-625-x/2018001/article/54982-eng.htm

Statistics Canada. (2018a). *Table 13-10-0096-07 Diabetes, by age group*. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009607

Statistics Canada. (2019). *Overweight and obese adults, 2018*.

Stellefson, M., Dipnarine, K., & Stopka, C. (2013). The chronic care model and diabetes management in US primary care settings: A systematic review. *Preventing Chronic Disease*, *10*, E26. https://doi.org/10.5888/pcd10.120180

Strauss, K., MacLean, C., Troy, A., & Littenberg, B. (2006). Driving distance as a barrier to glycemic control in diabetes. *Journal of General Internal Medicine*, *21*(4), 378–380. https://doi.org/10.1111/j.1525-1497.2006.00386.x

Szafran, O., Kennett, S. L., Bell, N. R., & Torti, J. M. I. (2019). Interprofessional collaboration in diabetes care: Perceptions of family physicians practicing in or not in a primary health care team. *BMC Family Practice*, *20*(1), NA-NA. https://doi.org/10.1186/s12875-019-0932-9

Vancouver Coastal Health. (2012). *Sea to Sky Healthy Heart Program*. https://happyheartsvancouver.files.wordpress.com/2013/03/pamphlet-sea-to-sky-squamish.pdf

Vancouver Coastal Health. (2015). *Aboriginal cultural practices: A guide for physicians and allied health care professionals*. http://www.vch.ca/Documents/AH-cultural-practices.pdf

Vancouver Coastal Health. (2019). *Service plan 2019/20-2021/22*. http://www.vch.ca/Documents/Service-Plan-2019.pdf

Vancouver Coastal Health. (2020a). *Diabetes clinic: Gordon and Leslie Diamond Health Care Centre*. http://www.vch.ca/Locations-Services/result?res_id=708

Vancouver Coastal Health. (2020b). *Diabetes education centre: North Shore chronic disease services*. http://www.vch.ca/Locations-Services/result?res_id=637

Vancouver Coastal Health. (2020c). *Healthy living program: Vancouver community*. http://www.vch.ca/Locations-Services/result?res_id=1347

Vancouver Coastal Health. (2021). *DASH: Data Analytics Solution for Health*. http://vchphcdash.healthbc.org/Pages/DASH.aspx

Wagner, Davis, C., Schaefer, J, Von Korff, M, & Austin, B. (1999). A survey of leading chronic disease management programs: Are they consistent with the literature? *Managed Care Quarterly*, *7*(3), 56–66.

Wagner, E. H., Austin, B. T., Davis, C., Hindmarsh, M., Schaefer, J., & Bonomi, A. (2001). Improving chronic illness care: Translating evidence into action. *Health Affairs*, *20*(6), 64–78. https://doi.org/10.1377/hlthaff.20.6.64

Wagner, E. H., Austin, B. T., & Von Korff, M. (1996). Organizing care for patients with chronic illness. *The Milbank Quarterly*, *74*(4), 511–544. JSTOR. https://doi.org/10.2307/3350391

Wagner, E. H., Davis C, Schaefer J, Von Korff M, & Austin B. (2002). A survey of leading chronic disease management programs: Are they consistent with the literature? *Journal of Nursing Care Quality*, *16*(2), 67–80. https://doi.org/10.1097/00001786-200201000-00008

World Health Organization. (2016a). *Framework on integrated, people-centred health services*. https://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_39-en.pdf?ua=1

World Health Organization. (2016b). *Integrated care models: An overview*. https://www.euro.who.int/_data/assets/pdf_file/0005/322475/Integrated-care-models-overview.pdf

World Health Organization. (2002). *Innovative care for chronic conditions: Building blocks for action*. https://apps.who.int/iris/bitstream/handle/10665/42500/WHO_NMC_CCH_02.01.pdf

World Health Organization. (2020). *Diabetes*. https://www.who.int/news-room/fact-sheets/detail/diabetes

Zgibor, J. C., Gieraltowski, L. B., Talbott, E. O., Fabio, A., Sharma, R. K., & Karimi, H. (2011). The association between driving distance and glycemic control in rural areas. *Journal of Diabetes Science and Technology*, *5*(3), 494–500. https://doi.org/10.1177/193229681100500304

Appendix A

Narrative Literature Review Matrix

Author/Date	Topic/focus/question	Concept/Theoretical Model	Context/Setting/ Sample/Method	Findings	Future Research/limitations	Conclusion/Notes
(Alharbi et al., 2016)	To assess the impact of information technology on changes in the levels of HbA1C using the CCM	Information technology; Chronic Care Model	Systematic review and meta-analysis of 32 clinical studies, mainly from the US	Studies focusing on electronic self-management systems demonstrated the largest reduction in HbA1C, followed by those with electronic medical records, an electronic decision support system, and a diabetes registry. In addition, the more CCM-incorporated the information technology–based interventions were, the more improvements there were in HbA1C levels.	Further investigation required to understand how, why, and when information technology can improve the care of patients with T2DM. This includes a cost-benefit analysis.	The results align with other reviews that changes must be made in multiple areas of the CCM in order to considerably improve the outcomes of diabetes care
(Baptista et al., 2016)	Review of randomized controlled trials to evaluate different elements of the Chronic Care Model (CCM) in patients with type 2 diabetes mellitus (T2DM) and to assess the influence of the CCM on different clinical outcomes.	Chronic Care Model (CCM) and Type 2 Diabetes (T2DM)	Systematic review of12 RCTs USA and Hong Kong	Greater benefit obtained through combing all 6 elements of CCM. Article review findings organized under each of the 6 CCM categories.	Studies reviewed included limitations such included short follow-up period and a low number of patients. Research including all 6 elements would be of benefit.	Prevention and early intervention with integrated management – isolated components of the CCM are not enough, but combining elements is better.
(Bongaerts et al., 2017)	Review of European Chronic Care programs that include	CCM and T2DM	Systematic Review of 12	Multifaceted diabetes care resulted in small improvements of outcomes, there is a lack of studies looking at	Meta-analysis of all reported outcomes was	Challenging to evaluate outcomes due to

	multifaceted diabetes care interventions for T2DM compared with usual diabetes care.		studies and Meta-analysis	all 6 components. Difficult to compare because of variety of components addressed and differing outcome measures. Most benefit found for newly diagnosed T2DM compared to people with prevalent diabetes.	not possible because of the heterogeneity of study populations, duration of the interventions – this is found with other reviews	heterogeneity of interventions and outcome measures.
(Busetto et al., 2016)	To answer two research questions: First, what are the context, mechanisms and outcomes of integrated care for people with type 2 diabetes? Second, what are the relationships between context, mechanisms and outcomes of integrated care for people with type 2 diabetes?	Chronic Care Model, integrated care, Context mechanism outcome model (CMO)	Systematic review of 32 Qualitative and quantitative studies	Due to the low number of articles reporting comparable quantitative outcome measures or in-depth qualitative information, it was not possible to make statements about the relationship between context, mechanisms and outcomes. Barriers at an innovation level include difficulties relating to the database or electronic medical record used for the innovation. At the individual professional level, reluctance to discharge patients or share care as well as general low provider engagement were often mentioned.	Future research should be conducted with the CMO model incorporated into study designs to gain insights into the relationships between the context, mechanisms and outcomes of integrated care.	Efficient resource allocation should increase investments at the organisational context level where most barriers are expected to occur.
(Canadian Academy of Health Sciences, 2017)	The report aims to present current best practices and emerging trends in chronic disease management.	CCM; self-management; patient-centered care	Summary report based on comprehensive review of care for people with chronic health conditions	Five key areas: 1) high prevalence of chronic conditions in Canada; 2) Patient-centered care is required for effective CDM; 3) critical elements of patient-centered care include interdisciplinary team and self-management support; 4) Clinicians require decision making tools that	Does not explain review process	Patient-centered care from multidisciplinary y teams focused on providing self-management support is key to effective

				consider the overall burden of disease to effectively manage people with multimorbidity; 5) the CCM is the most promising model for CDM.		management of chronic diseases. The CCM can be used to guide health care improvements.
(Chrvala et al., 2016)	Assess the effect of diabetes self-management education and support methods such as providers, duration, and contact time on glycemic control in adults with T2DM.	Self-management education and self-management support	Systematic review of 118 randomized controlled trials in adults with T2DM	A combination of group and individual engagement results in the largest decreases in A1C (0.88). Contact hours ≥10 was associated with a greater proportion of interventions with a significant reduction in A1C (70.3%). In patients with persistently elevated glycemic values (A1C>9), a greater proportion of studies reported statistically significant reduction in A1C (83.9%).	Some studies did not include a detailed description of the intervention and characteristics of the study population which limits generalizability of their results.	Robust data demonstrated diabetes self-management education results in a statistically significant decrease in A1C levels.
(Clement et al., 2018)	Chapter on Organization of Care from the Diabetes Canada 2018 Practice Guideline.	Chronic Care Model; Self-management	Clinical practice guideline for Diabetes Canada	Person with diabetes needs to be an active participant in care and care is organized within the context of the expanded chronic care model. Facilitated by an interprofessional team trained in diabetes care involving the primary care provider and case management and supported by clinical information and decision support system.	Despite including the CCM as a framework to guide the organization of diabetes care, there is no standardized approach in Canada.	The chapter reflects the value of using the CCM for QI work
(Elissen et al., 2013b)	To understand the effect of heterogeneity in outcomes when evaluating the Chronic Care Model	Chronic Care Model	Systematic review of 61 studies and 15 systematic review evaluating diabetes programs	HbA1C, systolic BP and guideline adherence were the most frequently evaluated outcomes with improvements in all for the intervention/CCM group. 3-4 components attained stronger results	Further investigations of heterogeneity to ensure evidence-based	Overall CCM results in positive outcomes, especially when including more

				– changes made in multiple areas to considerably improve the quality and outcomes of diabetes care.	improvements in care	than 2 elements of CCM
(Forbes et al., 2011)	Goal to outline an overview of the organization and delivery of diabetes education and self-care support.	Self-management education and support	Scoping review including 4 methods to collect data: literature review (211 papers), patient participation event (38 people), online survey (495 patients and 423 professionals complete the survey) and conference (20 participants).	A variety of themes were identified to in the organization and delivery of self-care – there was little consistency between the approaches and rarely embedded in a comprehensive framework for care delivery. 4 models were developed in an effort to shape self-care: a diabetes education pathway; integrating self-care and clinical-care; choice as a method of optimizing care; and an integrated framework for delivering for diabetes self-care.	Further research to identify the approaches that would be most successful in creating long term behavior change and benefit.	The lack of structure or consistency in approaches strengthens the case for the use of the CCM to guide change or another unified implementation strategy.
(Grover & Joshi, 2015)	The goal was to systematically review and evaluate various existing chronic disease models, their elements and their role in the management of diabetes, Chronic Obstructive Pulmonary Disease (COPD), and Cardiovascular diseases (CVD).	CCM, Improving Chronic Illness Care (ICIC), Innovative Care for Chronic Conditions (ICCC), Stanford Model (SM), and Community based	Systematic literature review of 23 studies. Majority in USA	CCM was the most studied model. Elements of the various models studied include delivery system design and self-management support (87%), clinical information system and decision support (57%) and health system organization (52%), care centered on the patient and family (13%), patient safety (4%), community policies (4%), built integrated health care (4%) and remote patient monitoring (4%).	Future studies should include racially and ethnically representative patients. Limitations include the inclusion of only studies that specifically mention a particular chronic disease model. There are individual	The variety of models makes the study of effective CDM challenging. A comparison of the models and all the elements is complex and therefore difficult to come to conclusions on the most effective frameworks to optimize care.

		Transition Model (CBTM).			elements of these chronic disease models that have been widely studied in literature but have not referred to a model.	
(Gucciardi et al., 2015)	This study explores the implementation processes of integrating specialized diabetes teams, specifically nurse and dietitian diabetes educators into primary care sites.	CCM, Self-management and team-based care.	Qualitative interviews with patients (23), educators (20) and primary care physicians (16). Ontario, Canada	The analysis revealed 3 themes: Right time, right place, right service; creating partnerships; operational complexities and strategies. The benefits to implementing specialized diabetes teams were explored as well as the barriers to implementation	Implemented in city settings; therefore potentially lacks generalizability to rural setting.	Effective implementation requires an understanding of the benefits (for buy in), proper introductory support, genuine invested support from management and organization, and the ability of team to communicate effectively and solve problems to offset challenges as they arise.
(Improving Chronic Illness Care (ICIC), 2020)	Website for CCM	Improving Chronic Illness Care and CCM		The Chronic Care Model (CCM) originated from a synthesis of scientific literature undertaken by The MacColl Institute for Healthcare Innovation in the early 1990's. The website provides resources available through the Improving Chronic Illness Care		

				program on the CCM and other related resources from improving chronic illness care such as the Patient-Centered Medical Home.		
(Lim et al., 2018)	To examine sustained effectiveness of multicomponent integrated care in type 2 diabetes.	Chronic Care Model; Integrated care	Systematic review and meta-analysis of 181 RCT evaluating 13 quality improvement strategies	Multicomponent integrated care lasting at least 12 months reduced HbA1C, SBP, DBP, and LDL levels. Due to their phenotypic heterogeneity, patients require individualized biomedical, cognitive, psychosocial, and behavioral interventions. The QI strategies: team change, patient education, patient self-management, electronic registry, and using relay to promote patient-provider communication had the largest independent effect.	Lack of access to patient-level data limited the robustness of our subgroup analyses. Here, socioeconomic, education status, sex, ethnicity, disease duration, health care system (e.g., public, private, subsidized), and access to drugs can all influence the effectiveness of integrated care.	Team-based care and improved information flow may improve patient-provider communication and self-management.
(Locke et al., 2020)	The purpose of the study was to identify diabetes services in the region and to co-develop community-university research project to address service barriers and gaps.	Community-engagement approach; culturally sensitive care	Web based search, environmental scan and a meeting with researchers and community members. Southern interior of BC, Canada	78 diabetes related services were identified, and the meeting produced plans for 2 collaborative projects: the development of a diabetes patient journey map and the development of a diabetes service hub with patient navigators.	Future research should include patients with diabetes to provide a more comprehensive perspective of diabetes services	Research that partners with members of the community at the outset has increased potential to create meaningful and sustained change.

(Manns et al., 2012)	To determine outcomes for patients with T2DM enrolled in primary care networks.	Primary Care Networks – multidisciplinary teams and T2DM	Primary Care Networks in Alberta, BC, Canada	The care received by patients with diabetes in the primary care networks was associated with more use of guideline-recommended screening and (for patients with prevalent diabetes) a lower rate of admissions to hospital or visits to emergency departments for diabetes- specific ambulatory care sensitive conditions. However, the absolute changes were small, and unable to establish causality. (Ontario implemented similar model = Ontario family health teams and patient centered medical homes in the US – they all seek to improve access to and coordination of care)	Future studies should aim to determine how primary care networks can best implement evidence-based programs for the management of diabetes. This study was not randomized	Primary Care Networks interventions and programs varied as there is no guiding framework on how to best implement CDM programs; therefore, challenging to accurately compare and evaluate.
(O'Brien & Hardy, 2003)	Experience of developing care pathways for NSF in UK.	Care pathways	Started in outpatient clinics with measured success and developed for inpatient and primary care settings.	Developed care pathways because clients were not receiving consistent medical management and there was no formal patient education program. Implemented and evaluated over 4 years. Care pathways equaled an important tool to deliver high quality, evidence-based care.		Authors encourage pathway to be used and adapted to fit other diabetic services.
(Olesen et al., 2020)	To synthesize primary research results on person-centered self-management education and supports for T2DM to identify effective interventions.	Self-management education	Integrative review of 22 studies (mix of quantitative and qualitative)	Majority of interventions were successful in improving HbA1C and quality of life. Limited benefit in lowering cholesterol, weight and long-term behavior changes. Many studies with positive outcomes were group programs where personal sharing and group interactions (peer support) improve self-management	The ability of the authors to compare specific interventions and specific approaches was limited because of the lack of	The application of person-centered approaches is more successful than traditional didactic self-management education. Provider training may have an

				by maintaining motivation and sustaining change.	detail and limited reporting in the studies. Diverse interventions and measures made it challenging to synthesize.	important role in achieving positive outcomes.
(Penn et al., 2015)	Goal was to model pathways in primary care to explore processes and points where people struggle to find self-management support. Then collated into a combined pathway to create a model to promote self-management.	Process mapping (but they called it creating maps to represent the experience of patient's progress through the system).	Operational research and modelling 21 NHS general practices in UK	Appointment frequencies are orientated to bio-medical monitoring rather than increasing the ability to undertake self-management activities. The model provided a visual picture of the complexities in achieving self-management support. It illuminated the lack of integration with community resources or other social support networks.	Future modelling to take into account resources beyond the health system	Self-management is quickly hidden from view in a system orientated to treatment delivery rather than to enhancing patient self-management. Care pathways provide a alternative to the CCM when organize self-management care.
(Reichert et al., 2014)	Detailed description of the services unique model of care: The St. Joseph's Primary Care Diabetes Support Program (SJHC PCDSP). It incorporates team-based care to provide patient education and self-management with	Integrated care; Patient Medical Home; Self-management; team-based care; Diabetes Canada Guidelines	Model of diabetes care serving 3000 patients in London, Ontario.	Combination of medical care and diabetes education. Team-based care includes a social worker to address the social determinants of health. It is supported by an EMR. Include remote support to all patients. Social worker facilitates behaviour modification group – "Craving Change" and weekly exercise plan.	Limitations of the paper is that is only descriptive, does not include outcome measures of success.	This is an example of comprehensive diabetes services in Canada and includes many features of the CCM but does not mention it in the article .

	active medical support at each clinic encounter.	; Patient centered care		Integration of diabetes self-care and management with the Patient's Medical Home.		
(Reynolds et al., 2018)	Aim to evaluate the pattern of health outcomes in chronic disease management interventions for adults in primary or community settings.	Chronic Care Model and variety of Chronic Diseases interventions	Systematic review of 165 studies (majority RCTs) Majority of studies in USA	Self-management support interventions were the most frequently implemented and resulted in statistically significant improvements in patient-level outcomes. Few studies included Health Care organization or Community Resources as the primary intervention.	There is a need for more research to address Health Care Organization and Community Resources as interventions.	Self-management is an integral part of high-quality CDM
(Ricci-Cabello et al., 2013)	Review to assess the effectiveness of QI strategies designed to improve diabetes care in rural areas – the authors wanted to look at how QI was specifically applied in rural areas to see if they had the same impact as the general population	QI initiatives and T2DM	Systematic review & meta-analysis of 26 studies from the USA, Canada and Japan.	Successful QI interventions include interventions with multiple strategies aimed at clinicians and/or health systems rather than traditional patient-oriented interventions. When case management was employed as a strategy, care being delivered in the community instead of a clinic, and not requiring patients to commute to receive the intervention all decreased HbA1c more effectively.	The considerable differences in the studies meant only glycemic control was used as an outcome. This limits the results as it is only one of several important outcomes.	QI have to move beyond only patient education but on organizational structures to have impact on health outcomes. The majority of interventions were focused on patient education, but these seem to be least effective.
(Sherifali et al., 2018)	Chapter on Self-management education and support Diabetes Canada 2018 Practice Guideline.	Chronic Care Model; Self-management; Patient-centered	Clinical practice guideline for Diabetes Canada	Education AND support required for best outcomes. Evidence support self-management education reduces risk of complications. Technology can support self-management education.	No standard framework for ease of implementation of self-management education and support. It is up	Self-management education should be provided to everyone with diabetes. Self-management support sustains the short-term

					to the provider/health organization.	benefits of self-management education.
(Siminerio et al., 2014)	To examine diabetes-related behavioral and psychosocial outcomes as well as patient satisfaction with telemedicine services provided by an endocrinologist at an urban area in partnership with a diabetes educator in a rural area, working together with patients and primary care providers.	Telemedicine ; team-based care; T2DM	Pre- and post-measures with 29 participants. Primary care in rural USA	There was significant improvement in empowerment, self-care (adherence to diet and monitoring), and reduction in diabetes distress. Patients reported high levels of satisfaction.	Limitations include small sample size and did not contain a control group.	The TREAT model may be a viable option for rural communities that suffer from a shortage of team-based diabetes specialist and self-management support services.
(Stellefson et al., 2013)	Goal to describe how researchers have applied CCM in the US primary care settings & outcomes of CCM implementation for T2DM.	Chronic Care Model; T2DM	Systematic review; of 16 studies; Primary Care setting in USA	CCM is effective in improving health of people with diabetes. Most benefit from incorporating multiple components, each site can select a combination of components to achieve optimal results. Self-management is highlighted to improve psychosocial and clinical outcomes. Other models need additional research – such as the Innovative Care for Chronic Conditions by WHO or Expanded Chronic Care Model by Barr et al.	Limitations includes the variability of study design did not allow authors to pool data.	Future research to determine if group or individual self-management education is best, more on culturally tailored programs, training to support use of technologies
(Wagner et al., 1999)	Describes survey and site visit results of the	CCM	Analysis of survey and site	Testing of the chronic illness model developed by a process of literature	Future work: the CCM is “like an	“Despite the recent flurry of activity

	chronic disease management activities of programs nominated as being innovative and effective and analyzised using the model for effective chronic illness care – later to be know the Chronic Care Model.		visits 72 innovative chronic illness programs	synthesis and expert review resulted in an effective method to describe the characteristic consistently shared by successful programs. One of the barriers identified was the reliance of programs on traditional didactic patient education models instead of self-management support.	evidence-based guideline" that can evolve as additional evidence arises	around improving chronic illness care in organized health systems, our review of the 'best practices'' identified relatively few organizations that have made the comprehensive system changes associated with demonstrably better patient and system outcomes"(p.79).
(Wagner et al., 2001)	The goal of the paper is to describe the CCM and how it has been applied to quality improvement activities.	CCM	Description of the model and 6 components.	Summary of evidence supporting the adoption of each of the 6 elements of the model to guide quality improvement. Useful guide demonstrating the intent of the 6 elements in improving chronic illness care.	As new evidence surfaces, the CCM continues to be refined and improved. One of the challenges as the model evolves is other models also emerge so which model is to followed for guidance?	Ultimately Chronic disease management requires: 1. Evidence- based medical management, and 2. Competent self-management. The CCM model helps health care organizations organize care to reach these goals.

(World Health Organization, 2016a)	Outlines a framework with the ultimate goal to integrate people-centered health services.	Integrated care; people-centered care	The framework includes five interdependent strategies: 1) Empowering and engaging people and communities; 2) strengthening governance and accountability; 3) reorienting the model of care; 4) coordinating services withing and across sector; and 5) creating an enabling environment. They cumulatively build more effective health services and lack of progress in one area, undermines the other strategies. Policy options and interventions are provided for each strategy.	Future work will require Core Health Indicators to include measures of integration and people-centered health services (which are critical but less frequently measured domains) in order to track progress.	The reorientation of health services will take a long approach and countries will need to define their own goals and strategies to implement the change towards an integrated and people-centered systems specific to the contexts they serve.

Appendix B

Environmental Scan Results: Community Resources

Name of Program	Goal of Program	Description (Including type of facilitator)	Location, method of delivery and duration or frequency	Referral criteria	Funding or Organized by
BC Diabetes (BCDiabetes, 2020) www.bcdiabetes.ca	Tertiary team-based care facility dedicated to the treatment of diabetes to help individuals in BC live healthier lives and minimize the impact of diabetes.	Services include clinical care, med management, counseling and pharmacy services. Team includes Diabetes specialist, physician and nurse case managers, dietician and access to an onsite pharmacist. Virtual care is available for clients. Research and clinical trials are important parts of the service.	N/A	Must be referred by physician (although website includes self-referral- the receptionist stated a physician referral is required).	Covered by MSP.
Canadian Diabetes Prevention Program (LMC Healthcare, 2020) https://www.lmc.ca/diabetes-prevention/	A 12-month, digital coaching program that empowers individuals with diabetes to lead a healthier life and reduce your risk	Pilot project. 12-month program consists of regular telephonic interactions with a personal Health Coach, online education modules and health tracking to help you make small, incremental changes to improve your health and reduce your risk of developing Type 2 Diabetes.	Via telephone and online resources. First 3 months, weekly telephonic sessions. From months 4 to 12, monthly telephonic sessions. Plus, monthly workshops	Only available in these cities in BC Greater Vancouver Vancouver Island Abbotsford Kamloops Prince George Dawson Creek Nelson (Location limited because participants must have access to LifeLabs for bloodwork)	Diabetes Canada

Name of Program	Goal of Program	Description (Including type of facilitator)	Location, method of delivery and duration or frequency	Referral criteria	Funding or Organized by
Diabetes Clinic: Gordon and Leslie Diamond Health Care Centre at VGH (Vancouver Coastal Health, 2020a) http://www.vch.ca/Locations-Services/result?res_id=708	Goal to provide education, support and treatment to individuals with complex diabetes management issues	Tertiary care Education and training on advanced carbohydrate counting, intensive insulin therapy and continuous glucose monitoring as well as endocrinology referral. Multidisciplinary team consists of nurses, dietitians, endocrinologists, geriatrician, psychiatrist, clerks, social worker, pharmacist and podiatrist.	N/A	A physician referral is needed. Click to download the form Eligible for individuals with complex management issues, including insulin therapy and presence of chronic or acute diabetic complications. Individuals on insulin or with chronic or acute diabetic complications	VCH
Diabetes Education Centre – North Shore Chronic Disease Services (Vancouver Coastal Health, 2020b) http://www.vch.ca/Locations-Services/result?res_id=637	Group diabetes and prediabetes self-management education. Also offers foot care, individual counselling	Registered Nurses and Dietitians with specialized training in diabetes care Offered in English and Farsi. Interpreter services for non-English speaking clients available, usually by telephone. Outline of class schedules for group education. Prediabetes Group Education - Class Outline	Three 3 hr sessions held one month apart Previously held in person in West Vancouver and since COVID virtually via zoom or phone	North Shore residents diagnosed with Type 1 or Type 2 diabetes, prediabetes (impaired fasting glucose or glucose intolerance), diabetes in pregnancy and insulin resistance. North Shore Chronic Disease Services Referral Form	VCH

Name of Program	Goal of Program	Description (Including type of facilitator)	Location, method of delivery and duration or frequency	Referral criteria	Funding or Organized by
Healthy Living Program (Vancouver Coastal Health, 2020c) http://www.vch.ca/Locations-Services/result?res_id=1347	Community-based lifestyle intervention program designed to support individuals who are at risk for chronic disease, such as type 2 diabetes, high blood pressure and heart disease.	The Healthy Living Program is a health promotion and chronic disease prevention and management program for adults living in Vancouver who have or who are at risk for developing chronic diseases. Interdisciplinary team includes: Registered Nurses, Registered Dietitians, Certified Exercise Physiologists Free	The program consists of 3 sessions in Vancouver: two hours each for three consecutive weeks. Sessions are in group settings to promote sharing and learning.	Self-referral or by Physician Vancouver Community Diabetes Education Program - Referral Form	VCH
Self-Management BC (BC Self-Management, 2020) https://www.selfmanagementbc.ca/_	Health programs for adults of all ages living with one or multiple ongoing health conditions, offered throughout British Columbia online, by telephone, or by mail. Included workshops specific to diabetes.	NEW online, phone and mail based programs. This service was not available prior to November 2020. Previously programs were run in person in select cities across the province. 1. Tool Kit for Active living plus Calls is a free program that includes a one-time mailing of resources and a small-group teleconference with a Program Leader and with other participants to review the topics in the booklet via zoom or phone.	1. The Tool Kit for Active Living - Diabetes + Calls Program is a free, six-session weekly program. Each week a Program Leader conducts a 30–45-minute teleconference call. 2. Coaches connect with participants by	Self-referral by email or phone.	Sponsored by Self-Management BC is supported by the Province of BC, University of Victoria and Institute on Aging and Lifelong Health

Name of Program	Goal of Program	Description (Including type of facilitator)	Location, method of delivery and duration or frequency	Referral criteria	Funding or Organized by
		2. The Self-Management Health Coach Program is a free, telephone-based coaching program to support people living with chronic conditions to become better self-managers and support participants to choose goals, initiate and maintain health behaviour change.	telephone, once a week for 30 minutes, for a period of three months		
Sea to Sky Healthy Heart Program (Vancouver Coastal Health, 2012) https://happyheartsvancouver.files.wordpress.com/2013/03/pamphlet-sea-to-sky-squamish.pdf	The Sea to Sky Healthy Heart Program is a rehabilitation program for people with chronic diseases such as cardiovascular disease, diabetes, COPD, asthma or anyone requiring risk factor modification.	Exercise and education program led by a Physiotherapist who will provide a personalized exercise evaluation plan and a Registered Nurse who will facilitate group education sessions and self-management counseling	12-week program with weekly 2 hr sessions (1 hour exercise and 1 hour education)	Referral from physician	Funded by VCH – plus a charge when in-person classes are running to access the recreation facilities ($60 for the program)

Appendix C

Semi-Structured Interview Questions

The goal of the semi-structured interview questions is to obtain the participants (clients or providers) knowledge of the state of diabetes services in Squamish, BC. The questions include:

1. What is your understanding of the services available for individuals with type 2 diabetes in Squamish, BC?
2. Which of these services have you accessed (or referred clients to access if you are a providers)?
3. Are there any services outside Squamish you have accessed (or referred clients to access if you are a provider)?
4. What are the barriers to accessing services?
5. What are the benefits or strengths of the services?
6. Are there any gaps in services? If yes, describe?

Appendix D

Preparation Timeline for the Key Stakeholder Meeting

Time until Meeting	Task
6 Weeks Prior	• Send out email invitation to meeting to primary care providers requesting representatives from each practice • Book room at health unit with audiovisual equipment to project presentation from computer and/or create zoom meeting invite • Update local data if it has been greater than 1 year since data was collected. • Identify coworkers interested in co-facilitating workshop and documenting discussion key points
4 Weeks Prior	• Confirm primary care provider and send welcome letter with agenda for the day • Send invitation to other participants including: Home Health manager, Home Health team lead, dietitian, rehab team member, social work, community pharmacist • Support co-facilitator in familiarizing themselves with the content of the findings, the goals of the stakeholder meeting and the semi-structure questions to guide the conversation with participants.
1 Week Prior	• Send reminder to all participants
3 Days Prior	• Book coffee and treats if meeting to be held in person

APPENDIX E

Sample Email Invitation

Subject line: Key Stakeholder Meeting for Type 2 Diabetes Care and Services

Hello,

You are invited to participate in a key stakeholder meeting on_____from 0900-1200 regarding the optimization of care and services for type 2 diabetes in Squamish, BC.

Key stakeholders from the Home Health program and primary care providers from the community are being invited to participate in a planning meeting to review recommendations and identify priorities for type 2 diabetes care in our community.

Please reply to this email by_____if you are interested in attending.

Coffee and treats will be served.

Your expertise and opinion are greatly valued, and we hope you will be able to attend.

If you have any questions, please feel free to contact Jennifer Shaw at Jennifer.Shaw@vch.ca or 604-848-9351

Thank you,

Insert email signature